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"It is now somewhat late in the day to be praising Mr. Lyde's work in the exposition of elementary geography. It is uniformly excellent. It is indeed remarkable that while almost everything in England of this sort is being badly done—slipshod, inaccurate, or (what is worse) tinged with political or religious bias—so admirable a series as that which has proceeded from his pen should have appeared to prevent one's despairing of the power of lucid and simple exposition in English Scientific Primers. We have no need to praise his editorship of Black's School Geographies. His three little works, 'The World,' 'Asia,' and 'The British Empire,' are already familiar as the best or, perhaps we ought to say, the *only* things of their kind. In this last 'grader' in Elementary Geography he has, if possible, given us a better excuse for unqualified praise. Everything in the little book is well done. It is lucid, it is original, it is compact. The illustrations are well chosen and well executed, and the arrangement is perfect. There can be no higher praise for work of this sort than to say that a grown man who has travelled reads it for new information and for suggestion, while a child learns in it at once the truths that form part of a liberal education. We are able to give that praise with the less reserve from the fact that we have tried the experiment. After a delightful hour spent over its 200 pages, we discovered that it had met, in a schoolroom—or nursery—of very keen critics, a much keener and (as we believe) an equally enthusiastic reception. It is unusual nowadays to praise purely technical work so highly. We trust our appreciation will not seem extravagant. It is at least sincere. In a word, it is a book we shall keep side by side with Mrs. Barbauld's, and if that judgment seems a trifle quaint, at least those who treasure the books of their own first learning will know what it means."

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PROFESSOR OF ECONOMIC GEOGRAPHY IN UNIVERSITY COLLEGE, LONDON

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PREFACE

THIS book is called a School Geography because I hope that it may be useful to some of those who, like myself, believe that Geography is the most educational of all school subjects except Literature.

With this in view, the introductory chapters are intended to suggest or recall to mind certain important principles of the science that are obviously connected with the relation of man to the planet on which he lives; and the book then proceeds to apply these principles, at some length, to areas that are likely to be specially familiar, and that are specially interesting or important, *e.g.* the British Isles, British Empire, Europe, the United States, and Africa.

The rest of the world is done on a relatively smaller scale, details being replaced by constant references to other areas which are treated with detail, and in which the same phenomena are exhibited, and the same causes are at work. This not only economises space, but also involves pupils

in the useful task of looking up for themselves relations of cause and effect and working out for themselves some of the grouping. .

For the same reason the references in the Subject-Index are largely to 'groups,' the details of which require to be verified and collected from the individual areas mentioned.

I may take this opportunity of thanking numerous critics, unknown to me personally, who, in the press and by correspondence, have corrected mistakes and suggested improvements in the various books for which I have been responsible. It is exceedingly difficult, even with the utmost care, to guard against mistakes and misprints; and my Publishers will esteem it a favour to have any pointed out to them.

Some attempt has been made by means of accents (' and `) to indicate the pronunciation of some names in the Index which are often accented wrongly.

L. W. L.

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A SCHOOL GEOGRAPHY.

INTRODUCTORY.

Some Physical Features.

1. THE primary division of the earth's surface is into land and water; and most of the important water-forms have corresponding land-forms, *e.g.*

Ocean.

Gulf.

Lake.

Continent.

Peninsula.

Island.

1. In technical language, the land, or solid rocky crust, is called the Lithosphere, and the water is called the Hydrosphere, the latter being two and a half times as extensive as the former.
 2. The link between the two is obviously formed by rivers, which cannot be treated apart from the mountain watersheds; and the greatest heights correspond roughly to the lowest depths—about five miles and a half (Mount Everest and the S.W. Pacific).
 3. The relation of land to water practically decides the distribution of animal and vegetable life upon the surface of the earth, and this relation is effected through the Atmosphere, by which the vapour drawn up from the water is carried over the land to be precipitated—mainly—by mountains.
2. Mountains are caused chiefly by the subsidence of large areas, and the consequent elevation of narrow bands, of the earth's crust.

1. The subsidence is due to the contraction caused by cooling, and is thus found in all parts of the world; each continent is formed of lines of 'folded' mountains standing above the 'depressed' ocean basins.
 2. Naturally, the earliest subsidences and elevations were the most gentle; thus, the oldest ocean—the Indian—is also the shallowest, and the youngest mountains—the Himalayas, Andes, Caucasus, and Rockies—are the loftiest.
 3. The different scenery of the different mountains is due to the different materials of which they are made. The character of the material also affects their value commercially; the older and harder rock—*e.g.* 'Primary'—usually contains great mineral wealth, while the younger and softer rock—*e.g.* 'Tertiary'—makes the most fertile soil.
3. Mountains have many uses—climatic, political, and commercial.

1. Thus, they keep off winds, indirectly attract clouds, and form sites for sanatoria in the Tropics. Thus, the Scandinavian Mountains exclude the mild S.W. Anti-Trade winds from Sweden, as the Rockies exclude the bitter N. winds from British Columbia; the Apennines shelter the vineyards of Naples from the N.E., as the Alleghanies shelter the orange-groves of Carolina from the N.W.

When winds saturated with moisture are forced—in rising to cross mountains—up into colder strata of air, the moisture is condensed, and heat is freed; and this rising heat draws in vapour to be similarly condensed. Thus, the Himalayas indirectly attract the S.W. monsoons to the source of the Brahmaputra and the Indus, as the Andes attract the Trade winds to the source of the Amazon and the Orinoco.

Generally speaking, both temperature and humidity diminish with height; and, as it is the damp heat that makes Tropical climates so unhealthy for Europeans, the mountains provide suitable summer stations, *e.g.* Simla, Darjiling, Utakamand.

2. Politically, mountains affect questions of national frontier, national existence, and national character. Thus, the absence of mountains where Kelt and Teuton meet has caused the mixture of race and language which has rendered the government of Belgium so difficult, especially in regard to education, and has made its S.W. frontier "the battlefield of Europe," *cf.* Steinkirk and Landen, Ramillies and Oudenarde, Quatre-bras and Waterloo.

Besides forming a more or less definite frontier, mountains also encourage and defend independent national existence. The Scandinavian mountains are responsible for the difficulty experienced in governing Norway from Stockholm, as the Cambrian Mountains were for that experienced in conquering Wales; the Alps have done for the Swiss what the Grampians did for the Gaels; "Africa begins at the *Pyrenees*."

Spain also shows the effect of mountains on national character. It is a compact series of deep valleys isolated from one another by chains of barren and inaccessible mountains; the rich valley pastures and the barren cave-riddled mountains have made it the land of bull fights and banditti. In a bleaker climate and under a different creed the similar valleys of Scotland and Wales have enriched the world with many a psalm and many a soldier.

3. Commercially, mountains are useful as the source of water and water-power, the natural home of mineral wealth, and the natural site for 'temperate' forests and pasture. Thus, the Massachusetts ('Great Hills') have done for the New England States what the Pennines have done for Lancashire and Yorkshire; the Chaudiere Falls are as useful to the saw-mills of Ottawa as the St. Anthony Falls are to the flour-mills of Minneapolis; glaciers, which in Norway are useless except as sources of ice for the fish trade, would in Australia be an inestimable blessing as a guarantee against drought.

The rain which feeds these watersheds, washes the soil off the face of the mountains, and thus lays bare mineral wealth. In this way, copper was laid bare on the windward side of the Chilian Andes, tin on the windward side of Tasmania, and gold on the windward side of the New Zealand Alps.

On this wet windward side also spring up magnificent forests, *e.g.* in British Columbia, Norway, and on the West Ghats, while on the dry leeward side there is equally magnificent pasture, *cf.* the Victorian wool, Canterbury lamb, Swiss milk.

4. Mountains should be carefully compared with plains, *e.g.* the Himalayas with the plain of Hindustan. It will be found that mountains concentrate a great variety of climates, scenery, etc., within a very small area, while plains spread a uniform climate, monotonous scenery, etc., over a very wide area. They also, of course, give all the facilities for cultivation and transport which mountains do not give;

they have, therefore, always been a temptation to invaders from barren highlands, and have offered no obstacle to invasion.

4. Rivers have no importance climatically, and—in modern times—not much politically, but their commercial importance is very great.

1. Rivers are important commercially, because they are the chief agents in removing soil from highlands to lowlands, they drive all kinds of machinery, and they provide transport. Thus, "Egypt is the gift of the Nile," as Holland is the gift of the Rhine; the mechanical power of Niagara is as valuable to the mills of Buffalo as that of the Murray is to the irrigation works of New South Wales and Victoria; and the value of transport may be gauged by a comparison of the city-girt banks of rivers like the Ganges or the St. Lawrence or the Danube with the deserted banks of rivers like the Indus, the Orange, the Clutha. Obviously, the value of a river for transport depends on its freedom from rapids, from ice, from a bar, from a terrific current, from great variation in depth and volume.

Rivers have also occasionally direct commercial value in the production of some commodity. Thus, the absence of lime-salts from the soil of Flanders makes the water of the Lys peculiarly adapted to the cleansing of flax, as that of the Rhone at Lyons is for dyeing silk, and that of the Maine (U.S.A.) rivers is for manufacturing pulp and paper. So, the presence of gypsum in the bed of the Trent makes Burton famous for beer.

2. Politically, rivers make good boundaries, and attract population. For instance, the Rio Grande is a convenient political boundary between U.S.A. and Mexico, *i.e.* between 'English' and 'Latin' America, as the Orange is between German West Africa and Cape Colony, and as the Thames is between the counties along its north and south banks.

The attraction of people to rivers involves commercial questions of food and communication, but becomes important politically when the particular country is too long (for its width) to be easily governed from a single centre, or when it is very much isolated by natural barriers of mountain or desert. Thus, Egypt is naturally divided into two parts—the Nile valley and the Delta (the old kings even wore *two* crowns); and the difficulty of governing such a long, narrow, desert-girt strip from a single place gave great

political importance to the Nile, and led to great rivalry between Thebes (valley), Alexandria (Delta), and Cairo (middle). So, the fact that Austria-Hungary is shut in by mountains everywhere except where the Danube enters and leaves the country, has made the river very important politically as well as commercially.

The connection between the two is illustrated, in modern times, by the "riverside" routes of railways, and, less recently, by the sites of great battles. Thus, the London and North-Western Railway climbs Shap Fell by the Lune and Eden valleys, as the Canadian Pacific Railway climbs the Rockies by the Bow and the Fraser valleys; Majuba Hill, Rorke's Drift, and Isandhlana are to the Buffalo River what Khartum, Omdurman, and Atbara are to the Nile, and what Mons, Jemmappes, and Fontenoy are to the Scheldt.

3. The importance of a river-system may be greatly increased if it includes any lakes, for a lake acts as a reservoir, a filter, a check on floods, an additional aid to transport, and even as a moderator of climate. As a reservoir, the Alpine type of lake—long, deep, and narrow, *e.g.* Geneva or Tanganyika—is more useful than broad shallow lakes like Ladoga or Victoria Nyanza, partly because it is generally at a greater altitude, and partly because it exposes a much smaller proportion of its volume to evaporation; it is also the more useful for transport, because it stretches over a relatively longer distance.

Lakes are almost equally, if less obviously, important as filters, checks on floods, and moderators of climate. Thus, it is entirely due to the filtering through the Great Lakes that the St. Lawrence does not bring down enough mud to deposit a delta or even a bar at its mouth, the heaviest flood being dissipated within a mile from its point of entry to the lakes; and their climatic influence is seen in the heavy snow-fall of Ontario, the dense timber of the Michigan peninsula, and the regular 'land and sea' breezes, especially round Lake Superior.

Climate.

1. Climate decides the distribution of animal and vegetable life on the face of the earth, and these two forms of life are closely connected, especially in the case of uncivilized nations.

1. Climate must be distinguished from weather. The latter is the particular amount of heat, moisture, and wind in a particular place at a particular time; climate is the sum of the average conditions which make a place suitable or unsuitable for animal or vegetable life.
2. Climate is determined by temperature, moisture, and wind.
 1. The temperature depends mainly on latitude and height.
 2. The moisture depends mainly on distance from large areas of water and the direction of the prevailing wind.
 3. The wind itself depends on inequalities of temperature, which produce inequalities of atmospheric pressure; and the movements necessary to equalise these inequalities form currents of air.
3. The relation of heat to latitude is a question of direct sun influence, and not of the influence of water or wind in transferring heat from a low latitude to a higher.
 1. The rotation of the earth on its axis causes daily changes of temperature, which are most felt in the Tropics; the revolution of the earth round the sun causes seasonal changes of temperature, which are most felt in the Polar regions. For instance, the difference between summer and winter temperature in the north of Newfoundland is sometimes nearly 50° , in the south of Ceylon it is seldom more than 5° .
 2. As the earth is nearest to the sun ('in perihelion') during the 'southern' summer, the sun's rays are hotter south of the Equator than north of it; and this helps to account for the intense heat of the Australian and South African summer.
 3. The sun's rays are warmer in low latitudes than in high latitudes because they are more concentrated, and because they pass through less atmosphere; and, as the rays fall on the earth obliquely in all latitudes when the sun is low down on the horizon, the morning and evening rays have often to pierce such a dense atmosphere that only the long waves of red light ever shine through.
 4. The length of the day also varies with the latitude, and the long duration of sunlight in high latitudes during summer

leaves very little time for radiation of heat. For instance, at Klondyke there are about 20 hours of daylight at mid-summer. Of course, the mid-winter night is correspondingly long ; but the snow helps to lessen the darkness and to keep the soil warm, though it is such a bad conductor of heat that it may delay the coming of spring by keeping the surface of the ground 'below freezing-point' until it is all melted.

5. In high latitudes the earth is so small in circumference that it is rotating very slowly ; and therefore the sun's rays pass very slowly over any given area of land.

4. Variations in height show exactly the same climatic changes as variations in latitude.

1. The peaks of high mountains are capped with 'Polar' snow, and their sides are covered with belts of vegetation, varying with the height. For instance, Mount Everest is covered with snow for *a mile* downwards from its crest, and has a Tropical jungle at its base, with 'Temperate' vegetation in between.
2. The slope also causes the sun's rays to fall more directly upon the surface, which accounts, *e.g.*, for the practice of planting fruit trees on a 'southern aspect' in England but on a 'northern aspect' in New Zealand.
3. Mountains also, incidentally, shelter the valleys and plains below them.

5. The importance of large areas of water is due to the fact that they are the source of all rain and the great moderators of climate.

1. The sun's rays heat only the surface of land, but can penetrate water to a depth of 500 feet ; and this is one reason why surface water does not become warm with the same rapidity or to the same degree as land does, and deep water does not radiate heat as quickly or as completely as land. Thus, water tends to raise temperature at night and in winter, and to lower it by day and in summer. For instance, Glasgow is much warmer in winter and much cooler in summer than Moscow, which is in the same latitude.
2. The oceans also contain currents of cold and warm water, which further moderate the climate ; and the warm currents have special relation to rainfall. Thus, the cold Labrador current keeps land in the latitude of Iceland frozen up for

4 or 5 months every year, while the 'Gulf' Drift enables barley to be ripened in Norway inside the Arctic circle; and the precipitation in Norway is at least twice as heavy as in Labrador.

6. The transferred heat of these warm currents and the vapour off them are distributed by the winds.

1. The Earth is always surrounded by two belts of high atmospheric pressure, the one about 35° N. and the other about 30° S.—the 'Horse Latitudes.' From these areas of high pressure the air is always moving to areas of low pressure, which are found both at the Equator and at the Poles; but in neither direction can this movement be due north or south. The Earth is spinning so fast at the Equator that the 'Trade-winds' are left behind, and seem to be deflected towards the west; it is spinning so slowly in the Polar regions that the 'Anti-Trades' get ahead of it, and seem to be deflected towards the east.
2. As winds move from a colder to a warmer latitude, they can usually carry more vapour than they can pick up; thus, *e.g.* in the Tropics, both the N.E. and S.E. Trades are remarkably steady, and their great evaporation causes the surface water to be intensely salt. Precisely the opposite is true of the Anti-Trades; but, as the N.W. Anti-Trades blow over much the larger area of sea, they are both steadier—'Brave West Winds'—and wetter than the S.W. Anti-Trades.

The direction of these regular winds accounts, *e.g.*, for the fact that in the Tropics east coasts are rainy and deserts are to the west, while outside the Tropics west coasts are rainy and deserts are to the east. So, too, outside the Tropics the fashionable quarter of towns is the 'West End,' *i.e.* to windward; inside the Tropics the 'West End' is the quarter to which the Easterly Trades carry all the smoke and smells, and therefore the 'East End' is the fashionable quarter.

3. As land heats and cools more quickly than water, it will have over it relatively cooler air, *i.e.* higher pressure, in winter and relatively warmer air, *i.e.* lower pressure, in summer. Thus, there will be a general movement of air seaward in winter and landward in summer, and this seasonal change has a corresponding daily change—'Land and Sea' breezes are miniature Monsoons.

Population.

1. Men live together in groups by nature and by necessity—because they like company, and because they cannot supply all their own wants.

1. Necessity has been the more influential cause. The desire for company is easily satisfied, but trade and defence need numbers ; and trade depends on the unequal distribution of commodities in different parts of the world, and the possibility of, and facilities for, transporting them safely from one place to another.

2. The character of the group depends on the character of the country. Cf. p. 369.

1. For instance, amongst hunting tribes every man is his neighbour's enemy ; from the nature of his occupation he prefers to follow it alone, and therefore his progress in civilization is very slow. In a land where there was no domestic animal which gave milk, and no grass out of which bread could be made, the Australian Black became a houseless cannibal ; the Eskimo, living in a cold desert, not a hot one, has to build a house of ice, and to make weapons out of the bones, clothes out of the skins, fuel out of the fat, food out the flesh, of animals slaughtered in the chase.
2. The Bedouin and the Lapp represent a great advance. Both have a domestic animal which provides food, clothing, and transport—the camel and the reindeer ; both have besides a staple food—dates and fish ; both are nomads, though the one wanders mainly in other people's business and the other for his own food ; both are traders, though the one collects furs on the outskirts of the world, while the other trades through the heart of it to rich lands on either side ; both depend for nothing on outside supplies, and despise the slavish tiller of the soil.
3. Like the Lapp, a fisherman is a hunter, engaged in destroying the resources of nature instead of increasing them ; but, like the Arab, he is also a trader. His boat is his camel ('ship of the desert') ; and, as he leaves his womenkind to look after the homestead while he is away on his trading or his raids, much power passes into the hands of women. Then, too, a perishable raw material, *e.g.* fish, will give birth to a local industry, *e.g.* fish-curing.

4. Hunters, shepherds, fishermen, migrate easily and willingly ; as agriculture and industries are introduced, population becomes denser and more stationary. Hunters know neither union nor obedience ; shepherds combine to tend and protect their flocks ; the habit of prompt obedience at sea makes authority respected amongst fishermen, while the division of authority between father and mother prevents it from becoming 'unlimited.'

3. With the introduction of agriculture and manufactures, city life begins; and the site of a city depends on considerations of defence, access, and natural wealth.

1. Easy defence implies the impediment of hills, the isolation of water, or the protection of superstition. Thus, the old centres of Edinburgh, Stirling, Dumbarton, stand on precipitous rocks ; Tyre, Venice, Cadiz, were protected by water ; Catania, Bethel, Llandudno, were sacred.
2. Easy access implies some 'line of least resistance' to communication—a harbour, a plain, a river-valley. The names of Portsmouth, Le Havre, Havana, speak for themselves ; roads or railways across a plain must meet at such places as Moscow, Berlin, Winnipeg ; Tiflis, Turin, and Peshawar command mountain passes ; caravan routes converge on Damascus, Timbuctu, and Bokhara ; the river and river-side traffic has created the great waterway and railway junctions of Allahabad, Belgrade, Montreal.
3. Natural wealth varies with the progress of civilization. In olden times flint for making and sharpening weapons attracted population to Salisbury, Winchester, and the route of Icknield Street generally ; clay for domestic utensils attracted them to Southampton, London, and Colchester ; salt for preserving meat for winter use attracted them to Northwich, Nantwich, and Droitwich. In modern times, coal, iron, and precious metals have done similar work, cf. Cardiff and Pittsburg, Grätz and Dannemora, Johannesburg and Coolgardie, Kimberley and Diamantina, Silvertown and Leadville.
4. Further, the conditions of modern life cause population to gravitate to a few very large centres.
 1. In an Oceanic Empire like the British, these centres are almost always the harbours on which all trade converges to enter or leave each country.

2. Climatic conditions also affect the distribution of population. A surplus population, finding a climate similar to that of their mother-country—with similar vegetation and conditions of human life—will form Colonies of Settlement, *e.g.* Canada ; where the conditions of life are so different as to be prohibitive of such settlement, there may still be Colonies of Exploitation or Trade, *e.g.* Tropical Africa.
3. In Colonies of Settlement the harbours are of relatively less importance than in Exploitation Colonies ; *e.g.* Halifax (N.S.) is relatively less important than Singapore.
5. The essentials of a really valuable harbour are :—
 1. A large, deep, safe anchorage, *e.g.* Walvisch Bay contrasted with Port Elizabeth.
 2. Easy access from the ocean in any weather or at any state of the tide, *e.g.* Sydney (N.S.W.) contrasted with Durban.
 3. Easy communication inland, *e.g.* Montreal contrasted with Bombay.
 4. Facilities for coaling, *e.g.* Esquimalt contrasted with Melbourne.
 5. Rich land or dense population behind the harbour, to give certainty of return cargo without delay or difficulty, *e.g.* Calcutta contrasted with Trincomali.
 6. Freedom from heavy duties and other 'uneconomic' disabilities, *e.g.* Hong-Kong and Halifax.
 7. Protection of situation or fortifications, *e.g.* Gibraltar or Aden.

Some Commodities.

1. Wheat is the most important Bread-Stuff. It is simply a grass, which becomes top-heavy when it is ripe, and which therefore requires special conditions of soil and climate.

1. It needs all the support that its roots and stalk can get from a stiff soil, and it can easily be injured by wet winds. Further, as a grass, it requires sunlight and moisture ; and its cultivation is impeded by mountains and rocky soil.
2. It will, therefore, grow best on a warm dry plain, which has a soil stiff enough to support the plant and to retain moisture ; and rich soil and easy access are additional advantages.

3. Such plains are found in the east and centre of Europe, the prairies of N. America, the pampa of S. America, and the rolling lands which stretch northward and southward from the huge watershed of Central Asia ; and questions of irrigation or transport draw special attention to the Volga, St. Lawrence, Mississippi, Plate, Indus, and Obi.

2. The most important substitutes for wheaten bread are Rye, Potatoes, Rice, Maize, and Millet. .

1. Rye and potatoes can be grown on poor soils in inclement climates, *e.g.* in Ireland, Finland, and Pomerania.
2. Maize and rice require heat and moisture—maize in a moderate degree, as in the temperate latitudes along the Dniester, Danube, and Mississippi ; rice in a much greater degree, as in the Tropical and semi-Tropical latitudes along the Irrawadi, Me Nam, and Yang-tsi-kiang.
3. Millet can flourish in a dry climate and on poor soil, and is therefore the staple crop in a country like the province of Madras.

3. The best Meat will come from rolling grass-lands where the air is clear and bracing, the ground firm and dry, and yet the water-supply unfailing.

1. Such conditions are only to be found on a large scale amongst the foot hills on the leeward side of some great mountain range, *e.g.* the leeward side of the Rockies, the Andes, the New Zealand Alps, and the European Alps. This accounts for the huge export of meat from U.S.A. (Iowa to Texas), Germany (Bavaria and Saxony), the Plate region (Fray Bentos and Paysandu), and the Canterbury Plains of New Zealand.

4. There are three great Fishing centres in the world, each with three great qualifications ; and there are three really important species of fish for food purposes.

1. The three centres are off the north-west corner of Europe, in the north-west corner of the Atlantic, and in the north-west corner of the Pacific—where there are large submarine banks near enough to the surface of the sea to be covered with seaweed in which the fish can find their food and lay their eggs.

2. The three qualifications for a fishing centre are abundance of fish, proximity to the fishermen's homes, and easy access to markets.
3. The three most important species of food-fishes are the cod, the herring, the salmon—the cod preferring deep salt-water, and the herring shallow salt-water, while the salmon require alternation of salt and fresh water.
4. The general idea that fish caught in tropical waters are unwholesome, is erroneous; but the colder the water, the better the fish—for food. Consequently, the river-made banks off the Yang-tsi-kiang produce coarser fish than the Newfoundland Banks; for the latter have been, and are still being, built up on a submarine plateau by the melting of icebergs brought down by the cold Labrador current into the Gulf Stream, and the consequent precipitation of the soil that all icebergs carry with them from the land on which they were built up.

5. The total Coal-production of the world is about 850,000,000 tons a year, of which the United Kingdom produces rather less, and the United States considerably more, than one-third—exclusive of lignite.

1. Germany comes third with under 120,000,000 tons.

6. As Iron has very rarely any commercial value unless it is found near to coal, the same three countries are also the great producers of iron.

1. The existence of coal, iron, and limestone near to one another forms the basis of all manufactures and of transport both by land and sea, and marks out the natural areas of industry. The 'island' conditions of the United Kingdom led naturally to specialisation in shipbuilding; the huge 'continental' distances of the U.S.A. led to the development of railway plant; Germany has paid most attention to textile and chemical industries.

7. The great Mineral-oil deposits of the world are in U.S.A. and Russia.

1. The U.S.A. oil comes almost entirely from Ohio and Pennsylvania, which are also rich in natural gas; the Russian product comes from the Caucasus district.

8. For Clothing purposes, the most important vegetable products are Cotton and Flax, and the most important animal products are Wool and Silk.

1. Cotton grows best on light soils in warm, moist, even climates, with salt in the soil or in the air—that is, on low land near the sea in Tropical and semi-Tropical latitudes, *e.g.* in the south-east of the United States, the delta of Egypt, and the river valleys of the Deccan. It can only be spun successfully in damp climates, in which the yarn can be subjected to great tension without fear of snapping; artificially damped mills, *e.g.* in Austria and Germany, cannot compete with mills in an insular climate, *e.g.* England and Japan.
2. The chief wool-exporting regions of the world are Australasia, the Plate basin, and South Africa, because sheep and goats—for wool-making purposes—require a dry temperate climate tending rather to warmth than to cold. Cattle could not live, still less flourish, on the semi-desert 'salt-bush' of New South Wales and the Great Karroo.
3. The flax fibre grows best on soil that has been fertilised for ages by the decayed leaf-fibre of deciduous forests, *e.g.* Central Russia; the silkworm is found wherever the mulberry flourishes, as in the Chinese provinces of Chekiang and Kwang-si, or under the shelter of the Bergamo Alps.

9. Both Tea and Coffee are of two main varieties—highland and lowland.

1. Apart from the elevation, both varieties of each plant require great heat, heavy rainfall, vegetable refuse, and shelter. The heat and the rain can be obtained near the sea in the Tropics, and shelter and vegetable refuse are afforded by mountains and forests, *cf.* the coffee plantations of the forest-clad Serra do Mar, and the tea-gardens of the forest-clad Ta-yu-Shan.

N.B.—'Liberian' coffee and 'Assam' tea are respectively the lowland varieties.

10. Cacao and Sugar-cane are both lowland plants, and both require great heat and moisture along with volcanic alluvium.

1. Sugar also requires salt and lime, and therefore grows best along a sea-coast, *e.g.* the East and West Indies, while cacao grows inland, *e.g.* in the Orinoco and Magdalena basins.

Trade Routes.

1. There are five great highways of British commerce—the Atlantic, the Suez, the Cape, the Plate, and the West Indian.

1. There are also subsidiary routes branching off these to the trade centres of other countries.

2. The Atlantic route, with abundance of steam coal on both sides and a comparatively short journey, does not need coaling-stations *en route*.

1. The more northerly trade includes, besides the Canadian products, grain and timber from the Eastern States of the Union, and fibre and fruit from the South-Eastern.

2. The chief ports are Boston, New York, Philadelphia, and Baltimore ; Wilmington, Charleston, Galveston, and New Orleans.

3. The Suez route commands the East African, Persian, and Arabian ; Indian, East Indian, and Australian trade.

1. Besides the special Indian, East African, and Australian products, the trade includes Arabian gum, Persian carpets and opium, East Indian sugar and spices, Manilla hemp and tobacco, Chinese tea and silk, etc. ; and the chief ports are Jedda, Bushire, and Basra ; Bangkok, Canton, and Shanghai ; Nagasaki and Yokohama.

2. This route includes the Mediterranean area, which is very important ; and it is guarded by Gibraltar, Malta, Aden, Perim, Diego Garcia, Singapore, and Hong-Kong.

4. The special products of this Mediterranean region include :

1. Various fruits, *e.g.* oranges and nuts, from Malaga, Almeria, Valencia, and Barcelona.

2. Wine from Certe, and olive-oil, soap, scent, and silk from Marseilles.

3. Wine, oil, fruit, sulphur, and marble from Palermo, Messina, Naples, and Genoa.

4. Wheat from Trieste and Fiume, currants from Patras and Piræus, and carpets and tobacco from Salonica and Constantinople.
5. Maize from Sulina, Galatz, and Braila, wheat from Odessa and Kherson, petroleum from Batum, and silk from Trebizond.
6. Raisins, figs, oranges, beans, etc., from Smyrna, Beirut, and Jaffa.
7. Cotton, wheat, and onions from Alexandria, gum and ivory from Tripoli, barley and esparto grass from Algiers.

5. The Cape route is now specially the South African route.

1. It still commands part of the Australian trade, and is guarded by Ascension and St. Helena ; but cannot compete—in time of peace—with the Suez route, or—in time of war—with the Canadian Pacific Railway route.
2. Besides the special South African or West African products it includes the rubber, palm oil, and ivory of the Congo Free State.

N.B.—The connection of the 'Severn' ports with West Africa is largely due to the use of palm oil in the tin-plate industry.

6. The Plate route was the old 'Cape Horn route' to Australia.

1. It includes the Brazil trade in rubber, coffee, rosewood, diamonds, etc., from Para, Bahia, Santos, and Rio de Janeiro, and the typically 'Plate' trade in grain, wool, and meat from Monte Video and Buenos Ayres.

7. The West Indian route will be greatly affected by the completion of the canal across the isthmus of Panama, and by the new Tehuantepec railway.

1. Besides the special West Indian products, the trade includes Mexican mahogany, tobacco, and silver from Vera Cruz.
2. The Nicaragua route for the canal is longer than the Panama route, but it is lower, healthier, and freer from earthquakes and floods.
3. Either route will save about 6000 miles between London and San Francisco, and 9000 miles between New York and San Francisco ; and this will affect the North American Pacific Trade, *e.g.* from Vancouver and Victoria.

8. Before the opening up of these great Ocean Routes, however, commerce was confined to the large inland seas.

1. Palestine was one of the first centres of this inland-sea traffic. It lies where the chief caravans of the Old World met, and its coast is backed by Mount Lebanon, which provided abundance of timber for shipbuilding. Inland there was the Syrian desert, which compelled the caravans to converge on the strip of fertile land between the desert and the sea; and in that strip the climate, with its products, varies from the Arctic snows of Lebanon to the Tropical heat of the Dead Sea lowlands. Consequently the Plain of Esdraelon was a highway for traders and for battle; and almost every known language and every known occupation met, even in a little town like Nazareth.
2. Italy was another centre—the central peninsula on the great inland sea, combining all the three kinds of land formation—*island, peninsula, and continent*—which meet at Venice, the old ‘Mistress of the World’; where a cathedral was built of stones collected from every quarry in the known world.
3. Greece was, both by position and by civilisation, the link between the other two, between the East and the West—a small, hilly, isolated promontory, from which the inhabitants were driven, partly by the pressure of population from within and partly by the pressure of foes from without.

9. And before the Inland Sea Civilisation, there was an age of River Civilisation.

1. Before the invention of good artificial light or of scientific agriculture, the great obstacles to progress were want of food and want of light in winter; and both these were minimised along the banks of tropical and semi-tropical rivers, *e.g.* in Egypt, Mesopotamia, Hindostan, China, where the latitude guaranteed the maximum of daylight, and where the soil and climate guaranteed the maximum of food.

BRITISH ISLES.

Introductory.

1. THE British Isles are, for their size, the most important area on the face of the earth.

1. They have a smaller area, but a larger and—with the exception of China—a more populous empire, than any other Great Power in the world.

2. The reasons for this extraordinary contrast are mainly the position, climate, and structure of the islands.

1. The position has saved them from continual invasion, invited civilisation, and sheltered refugees ; and it now commands the trade of the world.
2. The climate is free from extremes of temperature, guarantees abundance of rain, and helps to improve the soil.
3. The geological structure supplies a naturally fertile soil and abundance of minerals, especially coal and iron, *i.e.* fuel and machinery.

3. These advantages have made Britain the greatest naval power in the world, and enabled her to maintain a large population (41,000,000) in spite of her tiny size.

1. The excess of this population, however, over the natural means of subsistence at home, led to the colonisation of a world-wide empire.

General Surroundings.

1. As the British Isles lie on the eastern edge of the Atlantic, between 50° and 60° N., they have special advantages.

1. The latitude implies a temperate climate except where height interferes, and the insular position further protects them from extremes and from sudden changes of temperature.
2. This eastern edge is the one towards which the S.W. Anti-Trade winds blow off the warm 'Gulf' Drift; and this guarantees abundance of rain, especially along the west coast, and of transferred heat.
3. This position is also practically the centre of the land of the world. More than 40 out of the 53 million square miles of land on the surface of the earth are north of the Equator, and England is about half way between the extreme east of Asia and the extreme west of America.

2. Proximity to Europe is better than contact would have been.

1. The islands are near enough to Europe to benefit by intercourse with it, and far enough away from it to be free from its wars and pestilences—no small advantage, especially in the Middle Ages.

3. The number of large openings, especially in the west, which break up the coast into a succession of bold headlands and deep bays, makes the coast extremely long in proportion to the area.

1. The average proportion of coast to area in Europe is 1 mile to 200 square miles, and Europe has a much higher proportion than any other continent; but the proportion in the British Isles is 1 to less than 20.
2. The headlands represent the harder rock, and the bays represent the softer rock; and the deepest bays are found naturally where the fiercest waves and winds beat on the softest rock, *i.e.* along the exposed parts of the west coast.

4. The results of this very large proportion of coast are most beneficial.

1. The interior of the country is within very easy reach of both the commercial and the climatic advantages of the sea. For instance, no place in the whole country is 70 miles from the sea.
2. There are numerous harbours, some of which are very large and very safe ; and this makes transport of goods easy and cheap.
3. Further, the best harbours are most conveniently near together *vis-à-vis*—the Clyde and the Forth, the Mersey and the Humber, the Severn and the Thames.
5. The surrounding seas are very shallow, which is the cause of the enormous fishing industry, and which protects the islands from the influence of the *deep* Arctic currents.
 1. The great fishing centre of the Dogger Bank is nowhere more than 100 feet below the surface of the sea.
 2. The shallowness of the sea, and the shape and direction of the great estuaries, cause the tides to be very high, especially on the exposed west coast ; and this is of immense advantage to commerce.
 3. Thus, the inhabitants have every inducement to engage in various sea industries, *e.g.* fishing, such as lead on to ocean traffic. Cf. p. 39 and 64.

General Surface.

1. The area of the British Isles is about 121,000 square miles.
 1. Compared with some other countries of Europe, this area is insignificant,—being, *e.g.*, not much more than half the size of France or Germany.
 2. Compared with other parts of the British Empire, it seems still smaller ; India is 11, Australia is 25, and Canada is 30 times as large.
 3. Great Britain alone has an area of about 88,000 square miles, of which nearly 30,000 belong to Scotland, and about 7500 belong to Wales.
2. The political division of the kingdom into four areas under different names is not altogether artificial.

1. Besides being a separate island, Ireland is quite unlike Great Britain, being a large, low plain, enclosed by a rim of mountains.
2. Great Britain, like Egypt and Italy, was too long in proportion to its breadth to be easily governed, in olden times, from a single centre.
3. The physical obstacles of the Cheviot Hills and Solway Moss helped to give a separate political existence to Scotland, as, for a long time, the Cambrian Mountains did to Wales.

3. The physical features of the country are similar to those of the adjacent mainland, of which the islands once formed part.

1. The chalk cliffs of Kent reappear in the chalk cliffs of Calais, as the granite peninsula of Cornwall does in the granite peninsula of Brittany; while the Fens correspond to Holland.
2. The lochs of Scotland are similar in appearance and origin to the Fiords of Norway, and the Grampians are an extension of the old Scandinavian system.
3. The native plants and animals are the same as those on the opposite side of the submerged plain of the shallow North Sea and English Channel.

4. The country may be roughly divided into five well-defined areas.

1. North-west of a line from Dumbarton to Aberdeen, Scotland is mountainous and comparatively barren.
2. South-east of the same line, there is an expanse of fertile lowland and upland.
3. North-west of a line from Exeter to Berwick lie all the English and Welsh mountains.
4. South-east of the same line are the fertile lowlands and uplands of England.
5. Ireland is a marshy, saucer-like plain.

5. There is, therefore, no continuous mountain system throughout Great Britain and there is no true mountain chain.

1. The absence of mountains in the south and east, and the fertility of the lowlands, encouraged invaders, who sometimes brought civilisation; while the presence of mountains

in the west and north, and the barrenness of the highlands, were a great protection to the invaded natives.

N.B.—The mountains have been partly pushed up from below by terrestrial convulsion, and partly weathered into their present forms.

2. The fact that the general water-parting runs along the west, *i.e.* the wet, side of the country, accounts for the heavy rainfall of the west, the length of the eastward rivers, and the easy communication with the continent. It also accounts for the fact that the west is mainly famous for mining, manufactures, and cattle, while the east is mainly famous for agriculture and sheep.

Thus, Devonshire, Somersetshire, and Gloucestershire are famous for milk products; Leicestershire, Lincolnshire, and Yorkshire for wool. The Mersey and the Clyde basins are famous for mining and manufactures; while those of the Thames, the Trent, and the Tay are famous for grain (*cf.* Reading biscuits, Burton beer, and Strathmore whisky).

3. The country is too narrow, however, to be really dry anywhere; and this accounts for the suitability of inland towns, like Rochdale and Bradford, for spinning and weaving. *Cf.* p. 32.
6. The soil is naturally fertile except in the marshy and mountainous districts, and is abundantly supplied with coal and iron.
1. The constant rain and the numerous rivers have covered the lower areas, *i.e.* those most suitable for cultivation, with a good depth of soil.
2. Scotland and Wales have a large proportion of mountain and moor, and Ireland has a considerable proportion of marsh and bog.
3. The coal and iron are generally found close together, along with limestone (for flux), and near navigable water, which greatly increases their value.

Mountains and Rivers of England and Wales.

1. As the Pennine Range is a succession of moors and hills varying generally from 1000 to 2000 feet, it does not present a very formidable obstacle to

communication across the country ; but it rises to considerably over 2000 feet in some places.

1. It is highest where it is farthest from the west coast, Mickle Fell rising to nearly 2600 feet, and Cross Fell to 2900.
2. As the range runs due north and south, it is a considerable obstacle to the constant wet winds from the Atlantic.
3. In the south, where it is lowest and narrowest, vast beds of coal and iron have been upheaved on each side of the range. The eastern beds, between the sheep pastures of the Yorkshire moors and the Lincolnshire downs, have become the seat of the woollen trade ; the western beds, looking towards the great cotton area of America, have become the seat of the cotton trade.

2. As the Cumbrian group is joined to the Pennines by the high moorland of Shap Fell, communication north and south is not very easy.

1. The group consists of a ring of peaks, radiating from Helvellyn, and rising to over 3000 feet in Scafell, Helvellyn, and Skiddaw.
2. As they are so much higher and nearer to the sea than the Pennines, they have a much heavier rainfall, which collects in lakes along the valleys, *e.g.* Windermere, Derwentwater, Ullswater.
3. Their grandeur and their beauty are due, therefore, to causes which deprive them greatly of commercial importance.

N.B.—Their curious symmetry is due, not to their present geological structure, but to the 'dome' shape of the original mass out of which, by storm and stream, they have been weathered.

3. As the Cambrian Mountains are cut off by a continuation—in the Dee and the Severn valleys—of the strip of low ground which cuts off the Pennines from the sea, communication north and south is quite easy.

1. The isolated mountains of Carnarvon resemble those of Cumberland in their poverty of soil, their excessive rainfall, their lakes, their height, etc.—Snowdon and the Carneddls being even a few hundred feet higher than Scafell and Helvellyn.

2. The southern system of the Black Mountains and the Brecknock Beacons, like the southern part of the Pennines, contains coal and iron.
4. The Cheviot Hills belong more to Scotland than to England.
 1. Their chief peaks are nearly as high as those of the Pennine Range, from which they are separated by the low strip that gives easy railway communication between Carlisle and Newcastle.
 2. The range itself and the Solway Moss, in the days before the latter was drained, were a great obstacle to communication between England and Scotland; and railway communication still goes mainly *via* the two historic strongholds of Carlisle and Berwick.
 3. The soil and climate of the grassy slopes and moors suit the small short-woolled sheep which takes its name from the district.
5. The fact of the main water-parting being so much nearer to the west than to the east coast is reflected in the river system.
 1. By far the greater number of rivers flow to the east; and even of those which do not empty eastward, the most important, *i.e.* the Severn, Wye, Dee, and Usk, flow eastward for more than half their course.
 2. The eastward rivers are, except for the Severn and the Wye, much the longest; and, therefore, we may expect them to be the most useful for navigation and the least liable to floods. For instance, the Yorkshire Ouse, the Great Ouse, and the Trent, are all fully 150 miles long, and the Thames is 215.
 3. The eastward rivers have much the largest basins. For instance, the Humber basin alone embraces an area of about 10,000 square miles, *i.e.* nearly as large as Belgium.
 4. As the eastward rivers flow over the softer rock, they carry down more alluvium to enrich the land through which they flow; and, as they empty into the shallower sea, the alluvium often collects in such masses as to seriously impede their entrances.
6. The Tyne, the Wear, and the Tees all start close together on the drier side of the Pennines, and all reach the sea within from 70 to 80 miles.

1. Consequently they cannot have any great volume, or be navigable for any great distance ; and all three must owe their importance to the bed of mineral wealth through which they empty. Thus, the Tyne empties through the very centre, and the Wear along the south, of the Newcastle coal-field, while the Tees empties along the north of the Cleveland iron- and salt-field.

7. The Humber is the only opening along that part of the coast, and leads across the middle of a rich plain up to the minerals of the Pennine slopes.

1. The Aire stretches along the north and busiest part of the coal-field, while the Don cuts through its central and narrowest part.
2. The rivers of the Ouse basin are more valuable for manufacturing and irrigating purposes than for transport, while the greater size and length of the Trent make it equally useful for all three purposes.
3. The Ouse basin collects the agriculture of the Yorkshire plain and the manufactures of the Yorkshire coal-field ; the Trent basin collects the agriculture of the Midland plain and the manufactures of the Stafford and Derby coal-fields.
4. The head of navigation for sea-going vessels is at Goole and Gainsborough respectively, and barges can ascend very much farther—on the Trent as far as Burton.
5. The valleys of the Aire and the Calder give canal communication between Lancashire and Yorkshire, while the Upper Trent canals form part of the “Grand Trunk” system between the Mersey and the Thames.

8. Like the more or less useless Great Ouse, the Thames rises at a very low elevation (about 300 feet above the sea), and yet is very long ; consequently it ought to afford special advantages for navigation.

1. Its estuary gives sheltered navigation, with very regular tides, to the largest vessels for 50 miles—up to London Bridge ; and the tide goes on for 20 miles farther—up to Teddington (Tide-end-town) Lock.
2. Barges can reach Lechdale, 60 miles from the Nore ; and from there a canal gives easy communication with tidal water on the Severn.

3. Its political importance in olden times may be gauged from the fact that it is a boundary to no less than nine counties, and that its headwaters are within nine miles of the Severn.
4. Its commercial importance in modern times may be gauged from the size of London (cf. p. 39), the port of which practically extends from London Bridge to Queenborough, and includes such places as Chatham, Gravesend, Tilbury, Woolwich, Greenwich.

N.B.—Like the Severn and the Mersey, the Thames has every possible convenience for cross-traffic, including a tunnel.

9. The Severn is the longest river in the British Isles, its course from Plinlimmon to the sea being 240 miles.

1. As it drops on to the plain even before it leaves Wales, it is navigable for a great distance—for barges up to Welshpool; and the canal from Sharpness to Berkeley allows largish vessels to reach Gloucester.
2. As it has the highest tides in Europe, it gives access to the largest vessels even up an insignificant stream like the Lower Avon to Bristol. Cf. p. 42.
3. It empties through the largest and richest coal-field in Europe, and has very easy communication from it—*via* the valley of the Upper Avon—to the Trent valley and the great Central Plain.
4. Its position naturally gives it a large trade with Ireland, West Africa, and the West Indies. Cf. p. 16.

10. The Mersey is essentially a 'Pennine' river, flowing at first through barren moors and then over a low plain.

1. The south portion of this plain is very fertile, and contains valuable salt-beds, while the north portion is crossed by a rich bed of coal. Its position gives it an Irish and American trade, but it is much impeded by a shifting bar.

Mountains and Rivers of Scotland and Ireland.

1. The division of Scotland into three areas—Highlands or mountainous northern half, Lowlands or central plain, and Uplands or hilly regions in the

south—depends on a threefold division in the character of the rocks.

1. The Highlands are made up of huge stretches of moor and masses of mountain, interspersed with a few areas of lowland ; but there is no distinct continuous range, though the general name of Grampians is applied to a large portion of the Southern Highlands.
2. The Northern Highlands are remarkable for little except their magnificent mountain and loch scenery, and their deer 'forests.'
2. The Southern Highlands are much more important, politically and commercially.
 1. As they run more or less east and west instead of north and south, they tend to throw off rivers more or less northward and southward, *e.g.* the Findhorn and the Spey, the Garry and the Teith ; and the valleys of these rivers are of very great importance to railway traffic. Cf. p. 5.
 2. As they are, on the whole, higher in the west than in the east, the rivers have a general inclination eastward, which takes them out through the soft rocks of the east coast towards the fishing banks of the North Sea and the markets of the continent.
 3. They are remarkable for great masses of granite, some of their highest peaks being partly or entirely of granite, *e.g.* Ben Nevis (4400), Ben Macdhui (4300), and Cairngorm (4100) ; and wherever these are convenient for transport, it is worked, *e.g.* at Peterhead (red) and Aberdeen (grey).
 4. South of the particular range which is properly called the Grampians, there is a magnificent lake district, including Loch Tay, Loch Katrine, and Loch Lomond. Like the Cumbrian Lakes, they are really river-filled gorges ; they radiate from the heights surrounding the Moor of Rannoch.
3. As the Highlands are highest in the west, all the longest rivers flow to the east, the westward ones being only short torrents.
 1. The nearness of the watershed to the west coast, and its great height, guarantee a constant and abundant rainfall ; and the character of the surface favours the collection of this rainfall in lake-reservoirs and in rivers of great volume.

4. As the water-parting of the south is more or less in the middle of the country, the eastward and westward rivers are about equal in length.

1. The lowness of the southern hills, and their greater distance from the sea, make the rainfall less heavy and less constant.

5. Owing to the comparative size of the two areas, the influence of the Highlands predominates in the general river system of the country.

1. The eastward rivers are the most numerous, the longest, the most useful for navigation, and the least liable to floods. For instance, the Tay, the Spey, and the Tweed are all about 100 miles long, and the Dee and the Don are both more than 80; but no westward river except the Clyde (about 100 miles) approaches them in length.
2. The eastward rivers have also much the largest basins. For instance, the Spey has a basin of 1400 square miles, the Tweed one of nearly 1900, and the Tay one of over 2200; the westward basins, excepting the 1600 square miles of the Clyde basin, are absolutely insignificant.
3. As the eastward rivers flow over the softer rock, they carry down more alluvium to enrich the land through which they flow; and their pace is generally sufficient to prevent the alluvium collecting in a dangerous bar.

6. The river system of Scotland owes its importance mainly to the relation of plain to mountain.

1. Communication across the most important mountain chains is almost entirely dependent on the river valleys. For instance, the communication between the Spey and the Tay valleys, *via* the passes of Dalwhinnie and Killiecrankie, depends entirely on the Garry. Cf. the Nith and the Ayr, the Annan and the Clyde.
2. The great Lowland Plain does not coincide with any one river basin, but is crossed by a number of rivers in all directions, so that every advantage can be taken of its narrowness, its mild climate, its fertile soil, its mineral wealth, and the political and commercial importance of its "isthmus" character.

7. As the Scottish mountains are so much higher and steeper than the English, the Scottish rivers have

also greater volume and greater pace than the English rivers; and this causes them to cut long, narrow, isolated troughs.

1. These troughs form the typical glens and straths, which are so unlike the broad valleys of the English rivers.
 2. The greater volume and pace cause the rivers to carve broad estuaries, which to some extent compensate for the uselessness of the rivers themselves for navigation.
8. The rivers that drain directly into the North Sea fall into three natural groups.
1. The northern ones, *e.g.* the Dee and the Don, are noted for their grand scenery and their cattle pastures.
 2. The Tay and the Forth are great commercial highways through the rich agricultural soil of the Lowlands; and they contain, in Perth and Stirling, the two great strategical points of the country in olden days. Both places command all the traffic passing through central Scotland, both are at the head of navigation on their respective rivers, and both are now important railway junctions.
 3. The Tweed, with its famous tributaries of Ettrick and Yarrow, winds through a broad fertile plain, marked by the sites of famous old abbeys and Border castles, *e.g.* Melrose, Dryburgh, and Kelso; and the smooth, grass-grown hills of its basin, with their ideal sheep-pastures, gave rise to the woollen industries of Hawick and Galashiels. Cf. p. 14.
9. Only two of the rivers which empty through the west coast—the Clyde and the Nith (60 miles)—have a length of over 50 miles.
1. The Clyde is the most important river of Scotland, and represents all the industries of the country—from the pastures of the Lowland Hills to the agriculture of the Central Plain below Lanark, and the mining and manufactures of the Glasgow coal-field.
10. The Irish mountain and river system is unlike that of Great Britain.
1. As the mountains are along the coast, most of the rivers reach the sea on the side of the island on which they rise (cf. p. 27); and, as the mountains are broadest towards the north and the south, the northern and southern rivers

are comparatively long, *e.g.* the Barrow, Blackwater, and Bann.

2. As the main water-parting lies nearer to the east than to the west coast, the westward rivers have the greater length and the larger basins. For instance, the Shannon is 225 miles long, and drains an area of 7000 square miles ; the Liffey is only 50 miles long, and does not drain 500 square miles.
3. Owing to the flatness of the country, the Shannon is navigable up to Lough Allen—*i.e.* for over 200 miles ; and its lakes are merely expansions of its very sluggish current. In length, direction, and tides it presents a strong resemblance to the Severn.

Climate.

1. The size of the United Kingdom is so small, and its surface is so low, that there cannot be any great variety of climate.

1. As the country extends through less than 9° of latitude (600 miles), the variety which does exist must be due to some other cause than distance from the Equator.
2. Ben Nevis, the highest point in the country, is only 4400 feet high, *i.e.* not half the height of Mt. Etna, and not much more than a quarter the height of Mt. Blanc.
3. There are, however, distinct varieties of climate due mainly to moisture, wind, and slight differences of height.
2. The main features of the climate, therefore, are :
 1. As the islands are small and comparatively low, heat and moisture are distributed more or less evenly over the whole country.
 2. The 'marine' exposure of the west makes it milder and moister than the east, and the dryness of the 'continental' exposure gives the east rather greater extremes.
 3. Height and slope are much more important than latitude. The difference between the summer temperature of the extreme south and the extreme north of Great Britain is only 10°, while that between Fort Augustus and the top of Ben Nevis is 16°.
 4. The insular position and the 'Gulf' Drift save the country from all extremes of temperature, ice-bound harbours being entirely unknown.

5. The regular winds are S.W. Anti-Trades, which are as useful to trade as to climate. Cf. p. 8.

3. The effect of the highlands on the climate may be further illustrated.

1. Snowdon and Ben Nevis, as their names imply, are high enough to be snow-capped and icy-cold ; and snow lies for many months on much lower hills, *e.g.* Ben Lomond and Helvellyn.
2. The vegetation on the Carse o' Gowrie is very different from that on the Sidlaw Hills behind it ; so, the hop gardens of Herefordshire are overlooked by the bleak moorland of the Brecknock Beacon.
3. The Pennine Range shelters the Lancashire plain from the cold east winds, and cuts off the Yorkshire plain from the mild west winds.
4. Hastings is distinctly warmer than St. Leonards, and Conway than Llandudno, because in each case one is, and the other is not, protected by a cliff from the east wind.
5. Dolgelly has twice as much rain as Shrewsbury, because the intervening fifty miles is filled up with the heights of the Berwyn Mountains.

4. The effect of the sea on the climate may also be further illustrated.

1. Glasgow is both much warmer in winter and much cooler in summer than Moscow, which is in the same latitude ; and spring and autumn come very gradually in Glasgow, but very suddenly at Moscow.
2. On the Central Plain of England the air becomes chilly directly after sunset ; at sea-side places in the same latitude, *e.g.* Cromer or Aberystwith, the change from day temperature to night temperature is very slow.
3. In winter, Berlin is nearly 10° colder than London, and Orenburg is nearly 20° colder than Berlin ; in summer Berlin is about 3° warmer than London, and Orenburg is about 6° warmer than Berlin. The average difference in temperature between summer and winter is less than 30° in London, but more than 60° in Irkutsk.

5. As the sea is the source of all rain, and as the rain is distributed by winds, the rainfall varies with distance from the sea and the direction of the regular winds.

1. For instance, the regular S.W. Anti-Trades blow directly up the Severn valley, leaving annually about 50 inches of rain near Newport, about 35 inches near Chepstow, and about 27 near Tewkesbury.
2. As there are no regular winds blowing to the east coast, the rainfall there is much lighter than in the west ; for instance, Galway has more than 50, Skye more than 100, and Cumberland 150 inches, while Edinburgh and Dublin have only 30, and London has only 25.
3. In the broadest part of the country, *i.e.* in the latitude of Lowestoft, where the east winds are driest, and the level is lowest, the average rainfall is even less than 25 inches.
6. The heavy rainfall in the west is due, however, not only to the prevailing S.W. winds, but also to the warmth of the sea.
 1. The rotation of the earth and the S.W. winds deflect warm surface water from the Tropics towards the British Isles, and one branch of the 'Gulf' Drift flows directly up our west coast.
 2. This saves Scotland from having a climate like that of Labrador or Kamchatka, and gives the south-west of Ireland a winter temperature as high as that of Central Italy.
 3. The slight range of temperature enables work to be carried on out of doors all the year round, and the high relative humidity is as advantageous for spinning as it is for stock-rearing.
7. Those parts of the country where the annual range of temperature is smallest, have also the greatest percentage of sunshine.
 1. The sea-coast has more sunshine than the interior ; and the amount of sunshine increases with exposure to the S.W., the Cornish peninsula being much the sunniest part of the whole kingdom.
 2. The least sunshine is, of course, where there are most clouds, *i.e.* on the mountains or in the path of cyclones, *e.g.* the north-west corner of Ireland or the Orkney Islands.

Vegetation.

1. The vegetation, of course, depends on the soil and the climate; and it may be roughly classified under three heads:

1. Grass-lands, ordinary plough-lands, forests and fruits; and the plough-lands are divided mainly between grain, roots, and 'vegetables.'

2. Two-thirds of the whole usable area of the country is under grass, permanently or otherwise.

1. More than a quarter of the area in Great Britain is under clover and other sown grasses; but in Ireland it is nearly all permanent pasture, and Ireland has altogether about half as much grass-land as Great Britain.
2. On this area Great Britain feeds about 1,500,000 horses, 6,500,000 cattle, and 25,000,000 sheep; while Ireland feeds 500,000 horses, 4,500,000 cattle, and 4,000,000 sheep.
3. For our huge city population the milk supply is miserably deficient. Holland, which is only one-tenth the size of the United Kingdom, has about 4,000,000 more cows; more than a quarter of our milk supply is used for making butter and cheese; and hundreds of gallons go bad every day, because the poor cannot afford the price demanded for it.

3. The grain-area has been steadily decreasing since the repeal of the Corn Laws, mainly owing to foreign competition.

1. Wheat is now practically confined to the dry eastern plain, especially to the clay lands of the Thames and the Wash basins.
2. Barley is mainly confined to the mixed clay-and-chalk lands of the English Midlands and to the river valleys of eastern Scotland, especially along the Trent and the Tay (cf. Burton beer and Strathmore whisky).
3. Oats can flourish in a much damper climate, and are, therefore, grown widely over Ireland and Scotland.

4. The area under 'green crops' has also been decreasing, but not to nearly the same extent as that under grain.

1. Potatoes are still the most valuable of all the Irish crops, and are largely grown in Yorkshire, Lincolnshire, and the Scotch lowlands.
2. Turnips are essentially a Scotch crop, Banffshire producing the finest in the country; but Norfolk and Suffolk also produce considerable quantities.
3. Peas, beans, and hops are essentially English crops—the two former not being very important outside Lincolnshire and Suffolk, while the hops are largely confined to Kent and Surrey in the east, and to Worcestershire and Herefordshire in the west. Essex grows all three.
4. Garden vegetables are grown in large quantities round all the big towns, especially London; and the Scilly Isles grow early vegetables for the London market.
5. The area under forest has also decreased enormously, but not recently.
 1. Only about 5 per cent. of the country is still under forest, much the largest area being the 400 square miles of the New Forest and the 150 square miles of the Dean Forest.
 2. The most famous of the old forests, *e.g.* Sherwood, Epping, and the Weald, have practically disappeared, owing mainly to the use of wood for smelting iron in former days, but partly also to the growth of population.
 3. The chief commercial woods are oak and beech, which are found mainly on the lower and more fertile parts of England and Ireland; elm and ash are also important; and in the far north the soil and the climate favour the birch and the Scotch fir.
6. The fruit is mainly apples, pears, plums, and cherries, and the various small berries.
 1. The apples and pears come chiefly from the Severn Valley, *cf.* Devonshire and Herefordshire cider and Worcestershire perry; while the cherries and plums come chiefly from Kent and the other "Home Counties," (*cf.* London jams).

Minerals.

1. As the British Isles are composed of a great variety of rock, they contain a great variety of mineral wealth; but the supply of coal and iron, *i.e.* fuel and

machinery, is so abundant that the other minerals have been comparatively ignored.

1. About $\frac{1}{3}$ of the 'metal' wealth of the country is in iron, and about $\frac{1}{4}$ of the 'non-metal' wealth is in coal, the total production of coal being about six times as valuable as that of iron. (cf. note on p. 48).
 2. Except in Ireland, these two minerals—the most important of all minerals—have three great advantages: they are found side by side, close to navigable water, and along with abundant supplies of limestone and gannister—the limestone for a 'flux' in smelting and for a 'base' in converting steel, and the gannister for an insoluble 'lining' to the converters.
 3. In the production of coal the United States is our only serious rival; but its rivalry is most serious, because its seams are thicker, more concentrated, more recently opened, and much more easy to work than ours, and, consequently, the coal is much cheaper.
2. Of the 251,000,000 tons produced in this country during 1906, about two-thirds were produced by England, and one-sixth each by Scotland and Wales.

1. The production of the chief counties has varied recently between 12 and 36 million tons. The following returns (1904) are typical:

Durham, - - -	36	Lancashire, - - -	24
Glamorganshire, - -	30	Lanarkshire, - -	17
Yorkshire, - - -	29	Derbyshire, - -	15

2. The Irish coal-fields are small, separate from the iron-fields, and far from the sea; and, owing to political troubles and want of capital, they have not been properly worked.
 3. As the iron is found on the various coal-fields,* it is put to various uses.
1. The 'coast' fields specialise in shipbuilding. Cf. the Newcastle coal and Cleveland iron, the Whitehaven coal and Furness iron, the Glasgow coal and Lanarkshire iron.
 2. The 'inland' fields to which import of raw materials is easy, specialise in textile machinery—'cotton' machinery on the

*The Cleveland district raises over two-fifths of the total output of British iron-ore, though the best comes from Furness.

Lancashire coal- and iron-field, and 'woollen' machinery on the Yorkshire. Cf. p. 23.

3. The 'inland' fields to which import of raw materials is not so easy, specialise in hardware; and their characteristic product is articles which demand a considerable amount of labour for a small amount of raw material. Cf. the screws, pens, pins, nails, needles, watch springs, and bicycles of Birmingham.

4. Next to coal and iron, stone and slate are much the most valuable, the annual output being valued at about £10,000,000.

1. The most important stone products are marble and granite—the marble mainly from Derby, Kilkenny, and Devon, and the granite from Aberdeen, Leicester, and Carnarvon. Of the ordinary building stone—the Kirkcudbright, the Portland, and the Bath kinds are the best.

2. Silica is found everywhere, but is not much used except where the addition of coal and salt have encouraged glass industries, *e.g.* at Newcastle, St. Helens, and Birmingham.

3. The only good slates come from North Wales, but inferior qualities are worked in Cumberland, Perth, and Argyll.

5. Clay, salt, and tin are produced to the value of about £3,000,000 a year, the clay being much the most valuable.

1. The two great salt-fields are the 'Cheshire' and the 'Cleveland,' the valleys of the Weaver and the Wheelock being specially rich in the mineral; and the combination of salt and coal has given rise to great chemical industries, *e.g.* at Newcastle and St. Helens.

2. Brick-clay is fortunately quite common, but the deposits in the Thames basin have been specially valuable in the extension of London; fire-clay comes mainly from Stour-bridge; and china-clay was originally worked in 'the Potteries' district of the Trent basin, but is now taken there from the decayed granite of the Tamar basin.

3. Tin also comes from Devon and Cornwall.

6. Oil-shale, lead, and zinc are also important, with an annual value of from £500,000 down to £240,000.

1. The shale is confined almost entirely to Fife and Linlithgow, where it supports the various 'paraffin' industries of Bathgate, but reclaimed bog is yielding oil, *e.g.* near Dublin.

2. The lead comes from several districts, including Flintshire, Derbyshire, the Isle of Man, Lowther Hills, Durham, Westmoreland, and Wicklow.
3. The zinc comes mainly from Cumberland, the Isle of Man, Flintshire, Denbigh, and Cardigan.

Fauna.

1. The British Isles are extremely well provided with domestic animals and fish.

1. The climate is exactly suited to pasture, especially in the western half of the kingdom.
2. The freedom from foreign invasion has encouraged continuous progress in agricultural science.
3. The character of the surrounding seas supplies abundance of food fishes at places which are most convenient both for the fishermen's homes and for large markets.

2. Sheep are found all over the country, but specially on the moors and downs of England and on the highland districts of Wales and Scotland.

1. The drier moors and downs produce the better wool, while the damper mountains produce the better mutton.
2. Thus, the three great woollen districts of Yorkshire, Gloucestershire, and Roxburghshire are overlooked by the downs which have given their names to the special 'Lincoln,' 'Cotswold,' and 'Cheviot' breeds of sheep.
3. The 'Blackfaced' mutton of Wales and Scotland is the best in the world, and is reared largely on a barren granite soil, while the wool is raised on chalk and limestone.

3. Cattle are most numerous in the lower and milder parts of the country, and their kind and use vary with the soil and climate.

1. The sandstone of Cheshire and Devonshire, and the mild climate of Jersey and Guernsey, produce the best cream and butter.

N.B.—Irish butter would be equally good if it was made with equal care and cleanliness.

2. The lias of Somersetshire, Gloucestershire, and Liecestershire produces the best cheese, especially round Cheddar and Melton Mowbray, cf. Stilton. Cf. p. 22.

3. The valleys of Aberdeenshire and Durham produce the best beef.

N.B.—The number of cattle on the Central Plain originally gave rise to the great leather industries, *e.g.* of Stafford, Leicester, and Northampton.

4. Horses are mainly used in this country for draught purposes, but a considerable number are bred for sport.

1. The finest cart-horses in the world are bred on the carboniferous limestone of Clydesdale and Yorkshire, where their services are most needed. (Cf. the horses of the Kentucky limestone, U.S.A.) The best hunters are bred in Ireland, especially in the southern half.

5. Pigs and donkeys are most common in Ireland, where they abound everywhere; but pigs are also numerous in the Thames basin and the Pennine dales.

1. The best bacon is 'Wiltshire' and 'Berkshire,' and the best hams are 'Cumberland,' 'Yorkshire,' and 'Belfast.'

6. The fisheries are the most important in Europe, and Billingsgate is the largest fishmarket in the world.

1. The 'deep-sea' fisheries include the cod and flat fish of the Dogger Bank, the herring and haddock (cf. 'Loch Fyne' and 'Findon') of the Scotch waters, and the mackerel of the English Channel.

2. The 'shore' fisheries include the oysters of Whitstable and Colchester the shrimps of the Wash, and the mussels of the Forth.

3. The 'river' fisheries are comparatively unimportant, except for the salmon of the Scotch and Irish rivers and of the Eden, the Severn, and the Tees.

4. Fish to the value of £7,500,000 a year comes into Great Britain from the North Sea, mainly through the Scotch ports of Wick and Peterhead, and the English ports of London, Grimsby, Hull, Lowestoft, and Yarmouth.

5. The east coast is well situated, too, for procuring ice (from Norway), salt, and barrels, the salt and barrels being especially necessary in connection with the Scotch herring fishery.

6. Grimsby is the metropolis of the whole British fish trade, and possesses the same advantages over Hull that Harwich does over London: it is in purer water, nearer to the fishing banks, and more easily supplied with ice.
7. The fishing industry is the only satisfactory school for a navy, whether royal or mercantile. The heroes of the Armada hailed from the pilchard and mackerel ports of the Cornish peninsula, as the greatest French sailors have hailed from the sardine ports of Brittany. Cf. Plymouth and Devonport with Lorient and Brest.

Towns.*

1. London has a population of nearly 6,000,000. It is the largest city in the world.

1. It has two defects as a port: the channels up its estuary are not very good, and it has no coal or iron. The latter want is ruining its shipbuilding industry in these days of *steel* steamers.
2. It has, on the other hand, many merits. It commands the great international trade route through the Straits of Dover; it is just opposite the important Continental harbours of Antwerp and Rotterdam; it has a double tide, which goes 80 miles up the river; and the largest vessels afloat can reach the very heart of the city.
3. It is the centre of the land of the world; it is far enough from the west coast to have a dry, healthy climate; it has supremely good communication inland in all directions by rail or canal. Cf. the names of the railways—*Great Northern, Midland, North-Western, Great Western, South-Western, South Eastern*, etc.
4. The hops of Kent and the barley of the Eastern Counties supply its breweries; the fruit of Kent and Surrey supplies its jam factories; and the London clay supplies bricks for the enormous number of new houses added every year.
5. Its political importance is immense.

N.B.—West Ham (280,000) and Croydon (135,000) are really part of London.

2. Glasgow has a population of about 760,000.

1. It has a wonderful artificial harbour. Ocean vessels now load where, within the memory of living men, the Clyde was fordable on foot.

* See 'Note on Population,' p. 374.

2. It is on a rich coal and iron field, which has given it a very large shipbuilding industry ; and the coal has attracted, as usual, other trades—especially copper and chemicals.

N.B.—It is much cheaper to send metals to coal than coal to metals.

3. It looks westward to the rising population of North America, though its cotton trade is declining.
4. It stands at the end of the low central plain, where Scotland is not more than 40 miles broad, and it has excellent communication inland in all directions by rail or canal.
5. The soil round is fertile and well cultivated, especially in Ayrshire.
6. It collects goods from the whole neighbourhood—coal and iron from Airdrie, Hamilton, Coatbridge, Wishaw, and Motherwell ; linen from Johnstone, silk and muslin from Renfrew, thread and shawls from Paisley, etc.

7. It is the commercial and industrial capital of Scotland.

3. Liverpool has a population of about 685,000.

1. It, too, is on a navigable river with a coal-field behind it, and it looks towards America—from which it draws its staple, cotton.
2. The valley of the Weaver is rich in salt, and the salt and the coal have attracted a large trade in glass and chemicals, which is shared by St. Helens, and in copper, which is shared by Widnes.
3. Its position and the dense population behind it give it naturally a large trade with Ireland.

N.B.—Birkenhead (110,000) is really part of Liverpool.

4. Manchester has a population of about 545,000.

1. It stands on a coal-field with excellent communication north, south, and west ; it has the water-power of the Pennines behind it, and commands passes across the range.
2. Its nearness to the coast and the character of the south-west winds make its climate very suitable for cotton-spinning.
3. As a great centre, it manufactures machinery for cotton and for transport.

N.B.—Salford (220,000) is really part of Manchester.

5. Birmingham has a population of 520,000.

1. It stands on a plain in the very centre of the country, and has communication by rail or canal in every direction.

2. It has so much coal and iron that it specialises in hardware. The coal has attracted a copper trade, and the coal and the salt of the Droitwich district have attracted a large glass trade. Cf. Liverpool.
3. It specialises—naturally for an inland town, with no sea transport for heavy goods—in articles which demand a considerable amount of labour for a small amount of raw material, *e.g.* watch-springs, screws, pens, needles, bicycles.

6. Leeds has a population of 430,000.

1. It stands on a coal-field, with excellent communication north, south, and east; it has the water-power of the Pennines behind it, and commands passes across the range. Cf. Manchester, above.
2. The distance from the sea, and the protection of the mountains to the west of it, make the climate drier than that of Manchester; and, as this suits sheep, Leeds has become the great wool metropolis.
3. As a centre, like Manchester, it manufactures machinery for wool and for transport. And, as in the case of Birmingham, the pastoral district gives it a large leather trade.

7. Dublin has a population of 380,000 (Police area).

1. It has a poor harbour and no coal or iron, but has excellent communication by rail and canal.
2. It is just in the middle of the Irish coast, and opposite the great port of Liverpool and the dense population of South Lancashire.
3. The quality of its water is very suitable for brewing and silk-dyeing; and its characteristic products are stout and poplins.

8. Sheffield also has a population of 380,000.

1. It stands on a coal- and iron-field, halfway between the Lancashire and Lincolnshire coasts, and within easy reach by sea of the Swedish iron. This has made it a great railway centre, and given it a very famous industry in cutlery, steel rails, and armour-plate.

N.B.—It owed the rise of its cutlery industry to the possession of very fine stone for grinding purposes.

9. Belfast has a population of 350,000.

1. It has the advantage of a navigable, well-sheltered estuary, which runs right up into the Ulster flax- and iron-field: it is near enough to the Ayrshire coast to be able to import coal from Ardrossan very easily; its climate is favourable to a linen industry; and the modern demand for steel ships has given it a large shipbuilding industry.

10. Bristol has a population of 330,000.

1. It stands near a coal-field, and has a navigable river, but the coal is very hard to work, and the river has some serious drawbacks. The town, therefore, owes its importance to its old connection with America in the early days of colonisation; and it still shares in some of the trades which in those days it monopolised—*e.g.* tobacco, cacao, and sugar. It has excellent docks at Avonmouth.

11. Edinburgh has a population of 315,000.

1. Its importance is due historically to the Castle Rock, which commands the south bank of the Forth; and, when Scotland had really become one kingdom, this position made Edinburgh the natural capital.
2. It stands at the extreme east of the Lowland plain, and has excellent communication inland. It has also a useful little port in Leith, which can easily import ice from Norway for its fish industry.
3. It stands on the edge of a coal-field, where wood-pulp can easily be imported from Norway, and its water is very suitable for making paper.

N.B.—The water is also good for brewing. Cf. Dublin.

12. Five towns have a population of from 200,000 to 300,000—Bradford, Nottingham, Hull, Newcastle, and Leicester.

1. Bradford (280,000) stands on the edge of the Pennine range, with their water-power and their coal, amongst the sheep-farms of West Yorkshire; the water is suitable for dyeing, and the town specialises in worsteds and plush.
2. Nottingham (240,000) stands on the extreme southern edge of the 'Yorkshire' coal-field, where the Trent is still navigable. The drier climate does not allow so much strain to be put upon cotton yarn as in Lancashire; and, therefore, the town specialises in lace and hosiery. As the nearest town on that coal-field to London, it has become an important railway junction.
3. Hull (240,000) has no coal or iron, but stands on the only navigable opening between the Thames and the Tees, and is splendidly sheltered from the north-east storms. It is also directly opposite to the Elbe and to the Kiel Canal entrance to the Baltic, and has such excellent communication inland that it has become the commercial capital of York-

shire. Its estuary and its position with regard to the Dogger Bank have given it a very large fishing industry.

N.B.—Leeds is the industrial capital, and York is the political and ecclesiastical capital.

4. Newcastle (215,000) stands on the most famous coal-field in the world, and close to the Cleveland iron- and salt-field. The coal and iron have given it a large shipbuilding and engineering industry, and the coal and salt have attracted glass and chemical trades. (*Cf pp. 40, 41.*) The Tyne is exposed, and had a bad bar; but it has been improved very much to meet modern needs.

N.B.—Gateshead (110,000) is really part of Newcastle.

5. Leicester (210,000) stands amongst the farms of Leicestershire, with their famous breed of sheep, and has a woollen and a leather industry. The water, as in the neighbouring county of Derbyshire, is very suitable for dyeing silk; and Leicester has also a silk industry, especially in hats.

13. Twelve other towns have populations of from 110,000 to 200,000.

1. Portsmouth (190,000) is too far from coal and iron to be a good commercial harbour, even if it had not an over-powering rival in Southampton, which is much farther inland; but, like Southampton, it is sheltered by the Isle of Wight from storms and from enemies. Being opposite our old enemy, France, it has been made the great naval arsenal of the country.
2. Cardiff (170,000) exports more coal than any other town on the face of the earth, and the coal is very good. The town stands between the iron of Glamorganshire and the tin of Devon and Cornwall, which has given it the largest tin-plate industry in the world; and it has direct communication up the Taff valley to the great iron centre of Merthyr Tydvil. The 'Severn' trade with the west coast of Africa includes palm oil, which is essential as a 'flux' in the tin-plate trade. *Cf p. 16.*
3. Dundee (160,000) has no coal or iron, but it can easily import coal from Fife. It is just opposite the entrance to the Baltic, from which it can import flax and hemp, and the trade in these fibres has attracted a trade in other fibres, *e.g.* jute; while the fertility of the sheltered Carse o' Gowrie has given it a large jam industry. It has communication inland by river—as well as by rail—up to Perth; and, as the most northerly port of any real value except Aberdeen, it is the headquarters of the whale-fishery.

4. Bolton and Oldham (168,000 and 137,000) stand on the Lancashire coal-field, exposed to the damp south-west winds, and looking towards America. Where, as in Lancashire, towns cluster together in great numbers, there can be minute Division of Labour—spinning, weaving, printing, dyeing, etc.; Bolton and Oldham spin. Bolton has also a very important engineering industry, and makes spinning machinery. Both of them have the water-power of the Pennines.
5. Aberdeen (153,000) stands at the junction of two river valleys, which give communication right up to the interior, and which have produced a famous breed of cattle; it has also an important granite industry, and is one of the fishing centres of Great Britain. Its cattle trade gives it an industry in combs and other horn articles, and its command of traffic along the coastal plain made it a university and a railway-junction.

N.B.—A certain kind of haddock originally took its name from the neighbouring village of Findon.

6. Sunderland (146,000) stands on the Durham coal- and iron-field at the mouth of the Wear, just opposite the Kiel Canal entrance to the Baltic, from which it can import fibres. It has, therefore, a shipbuilding and a sail-cloth industry.

N.B.—Merthyr Tydvil (123,000) and Rhondda (112,000) form the most important centre of the South Wales coal- and iron-field.

7. Brighton (123,000) stands on the sunny south coast, within easy reach of London, and has mineral waters.
8. Preston (115,000) weaves cotton, and is on the navigable estuary of the Ribble, where it is crossed by the main line of the London and North-Western Railway.

N.B.—The great junction of Willesden is the same size as Preston.

9. Norwich (112,000) stands amongst the famous sheep-farms of Norfolk at the confluence of the Wensum and the Yare; it is very conveniently situated for trade with the Flemish wool merchants in the Middle Ages; and until the textile trades were transferred to the coal-fields, it was the woollen metropolis of the country.

N.B.—A large number of towns in the above list are in Lancashire and Yorkshire, where fuel, machinery, climate, and facilities for transport encourage great textile industries. Cf. Halifax (105,000), Burnley (100,000), etc.

The British Empire.

1. The British Empire covers about one-fifth of the land of the globe; and the tonnage of its Merchant Navy is greater than that of all the other countries in the world put together.

- 1. Out of about eighteen millions of steam tonnage alone, the British Empire owns about nine millions.**
- 2. The huge extent and varied character of the different parts of the Empire give the command of all kinds of commodities, and the large fleet provides every facility for the cheap and rapid transport of them.**
- 3. The fact that this transport is conducted by water is an immense advantage, for water-carriage is very much cheaper than land-carriage for several reasons. For instance, a horse that can draw only one ton in a two-wheeled cart can draw 40 tons in a barge.**

2. British commerce demands the occupation of posts of vantage along the Great Trade Routes and the maintenance of a powerful navy.

- 1. War disorganizes all commerce while it lasts, and involves countless sacrifices in the preparation for it, e.g. difference of railway gauge, hindrance of fortifications to the natural growth of towns, loss of male labour during time of military service, enormous taxation, etc.**
- 2. The internal trade of a small country, like the United Kingdom, that is rich in coal and iron, must merge in an external trade; and any country, small or great, which cannot provide itself with sufficient food, must import bread and meat.**
- 3. The most valuable producing areas are the Colonies of Settlement, where some 200,000 British emigrants seek work, or fortune, or adventure every year; the most important posts of vantage are the political fortresses along the routes joining these producing areas. Cf. p. 11.**

3. The early history of the Empire includes three epochs of geographical discovery.

- 1. Its beginnings in the sixteenth century were characteristic of the 'spacious days of great Elizabeth,' when Sea Dogs**

like Drake and Hawkins made gallant individual efforts to win New Worlds for their Faerie Queen ; but the efforts were so disjointed and spasmodic that they could scarcely be expected to have had much permanent effect. The British possession of Newfoundland dates, however, from about 1583.

2. A firm foundation was laid in the seventeenth century by means of Merchant Companies like the Hudson Bay Company and the Virginia Company. Their settlements, though small and isolated, were definite attempts at colonization and development of commerce ; and their political importance appealed at once to a soldier and statesman like Cromwell, and led to their permanent annexation to the Mother Country.
3. In the eighteenth century the Merchant Company was superseded by the scientific explorer, *e.g.* Cook, as the private adventurer of the sixteenth century had been superseded by the Merchant Company ; but isolated instances of both the old forms of colonization were found, and both the private enterprise and the commercial schemes were used to promote the new object of Imperial dominion.
4. The development of Africa was left for the nineteenth century, for various reasons, which have caused it to be appropriately called 'the dark Continent,'—the most obvious being that its geographical conditions have been a tremendous obstacle to its exploration.
5. It is worthy of notice that the original 'trade motive' in most parts of the Empire was a desire for luxuries, *e.g.* furs, spices, jewels, precious metals, etc.; and the trade in luxuries led to the far more important trade in comforts and necessities, *cf.* the grain and timber of Canada, the cotton and tea of India, the sugar and tobacco of the West Indies.

4. British America comprises the Dominion of Canada, Newfoundland, with its province of Labrador, the Bermudas, British Honduras, British Guiana, the British West Indies, and the Falkland Islands.

1. Owing to its position and its size, Canada is the most important British colony. It is the largest continuous stretch of land under one flag except Russia and China ; it is larger than the United States without Alaska, and nearly as large as Europe ; it constitutes nearly half the British Empire, and is about forty times as large as Great Britain.

2. Newfoundland, with Labrador, is nearly twice as large as Great Britain ; but Labrador is valueless, and Newfoundland alone is only about six times as large as Wales, *i.e.* considerably smaller than England.
3. The Bermudas have an area about one-third that of Bute, or one-seventh that of the Isle of Wight.
4. Except Haiti, Cuba, Puerto Rico, and the two French possessions of Martinique and Gaudeloupe, nearly all the islands of importance in the West Indies belong to Great Britain. Their total area is nearly twice that of Wales.
5. British Honduras is rather larger, and the Falkland Islands rather smaller, than Wales ; and British Guiana is nearly the size of the United Kingdom.
5. The total area of the British possessions in Africa is larger than Australia, and nearly as large as Canada.
 1. The area of the largest possessions—British East Africa, British Central Africa, and British Nigeria—is not known with any approach to accuracy ; but the East African area is certainly over 1,000,000 square miles, and the Nigerian is certainly over 500,000.
 2. At present the South African area is the most important, because of its command of the sea route to India and Australasia, its definite settlement, and its temperate climate.
 3. Amongst the newly acquired possessions, Central Africa is the most important ; it has the richest minerals and the most fertile soil, and commands the ‘Cape to Cairo’ rail and telegraph route.
 4. The oldest possessions, Gambia and Sierra Leone, are also the least valuable ; the latter is about twice the size of Wales, and the former about the size of Cheshire or Dumfriesshire.
6. The British possessions in Asia have an area much smaller than those in Africa, not reaching a total of 2,000,000 square miles ; but they are, of course, immensely valuable.
 1. The Empire of India has an area of more than 1,500,000 square miles, *i.e.* a dozen times the size of the United Kingdom, and a population of nearly 300,000,000, *i.e.* more than Africa, North America, and South America all combined.

2. Though the other Asiatic possessions are not large, some of them are very important ; and they include a remarkable series of Imperial 'footholds'—from Cyprus, *via* Aden, Colombo, Singapore, and the Cocos Islands to Hong Kong—by which our commerce with the East is supplied with protection, coal, and telegraph facilities. Cf. p. 15.
3. If Europe is regarded as a peninsula of Asia, Gibraltar and Malta must be added to this list, with their garrisons of 6000 men each. Malta also has a magnificent harbour at Valetta, and raises large crops of excellent fruit and early vegetables, in spite of its violent winds.

7. The total area of the British possessions in the Pacific Ocean is just over 3,000,000 square miles.

1. Of this large area, nearly one-third represents West Australia, more than half of which is desert ; and South Australia, also largely desert, is nearly as large as West Australia.
2. Queensland and New South Wales together occupy another million square miles, Queensland being twice as large as its neighbour.
3. Victoria, like New Guinea, is about the same size as Great Britain ; and New Zealand is rather larger.
4. Although the Dutch had discovered most of Australasia in the seventeenth century, Captain Cook explored and opened up the most fertile parts, *e.g.* the east coast of Australia.
5. The Dutch kept their discoveries secret, partly from commercial jealousy of Spain, and partly because the island did not seem to them to be of much value ; it is a land that could only have been developed by actual colonization by a free race, and their whole system depended on slave labour.
6. The arrival of the first 'convict' fleet at Botany Bay in 1788 is the beginning of its real history, and the settlement of the country seemed to the English people to replace the lost United States ; the first goldfield was discovered in 1835.

N.B.—The output of the chief Imperial coalfields in 1905 was : Indian, 8,425,000 tons ; Canadian, 7,836,000 ; Australian, 7,496,000 ; Transvaal, 2,327,000 ; New Zealand, 1,586,000 ; Natal, 1,129,000.

EUROPE.

Introductory.

1. EUROPE is the smallest of all the six continents except Australia, but it is the most populous of all except Asia. It is also the most civilised, the most wealthy, and the most powerful.

2. This pre-eminence is due mainly to five geographical advantages :

1. It lies almost entirely within a temperate zone, free from extremes both of heat and cold, of damp and drought.
2. It lies in the centre of all the land of the world, which gives its inhabitants great opportunities for trade.
3. It has an extremely long coast, broken up by innumerable bays and seas, which enables this trade to be carried on by water.
4. It has an abundance of rain brought to it by regular south-west winds—"Anti-Trades"—off the Atlantic Ocean, which enables the inhabitants to take full advantage of the fertile soil.
5. It has great mineral wealth, especially of the two most important minerals, coal and iron, which provide fuel and machinery, and which are fortunately found side by side in Europe.

3. Europe is part of the "Old World," which consisted only of Europe, Asia, and Africa; and it is really a peninsula of Asia. But it is so distinct from Asia

in its geography, and has had such a distinct history, that it is treated as a separate continent.

1. The two areas were still more distinct when the Caspian-Aral depression was a continuous gulf of the Arctic Ocean. Cf. p. 53.

General Surroundings.

1. As Europe is surrounded by sea everywhere except on the east, the abundance of water ought to affect its climate, its commerce, and its defence.

1. It ought to make the climate more moist, and therefore more even, than it would otherwise be ; but much will depend on whether the prevailing winds have come over sea or over land.
2. It ought to tempt the inhabitants into various sea industries, especially fishing, which will eventually prepare them for ocean traffic.
3. It ought to protect them from the pestilences and the wars of their neighbours.

2. The land boundary of the Ural Mountains is not important.

1. It is not very high, the average height seldom being greater than that of Ben Lomond, so that it is not a formidable barrier either to winds or to invasion ; and Russia owns the country on both sides of the range, so that the slightness of the barrier facilitates commerce and communication.

N.B.—In East Russia the political frontier of Europe actually goes some way to the east of the Ural Mountains.

3. Europe has much more coast in proportion to its size than any other continent.

1. For instance, Africa is about three times as large as Europe, but Europe has three times as much coast-line as Africa.
2. The cause of this is the very large number of gulfs, bays, and inland seas, which break up the coast into a succession of peninsulas—the Crimean, the Balkan, the Italian, the Iberian, the Scandinavian. Owing to the pressure of foes from without and of population from within, the inhabitants,

e.g. the Greeks and the Italians, began to emigrate in very early times from these contracted areas. Cf. p. 17.

3. The results of it are—that no part of the continent, even in the heart of Russia, can be very far from the climatic and commercial advantages of the sea ; and that there are innumerable harbours, some of them being very large and very safe. This enables goods to be conveyed to or from the interior of the continent very easily and cheaply.
4. There are also a number of islands round the coast.
 1. The so-called 'European' Islands include several which are at a considerable distance from the coast of Europe, or which have little or no connection with it—*e.g.* the Faroe Islands and Iceland.
 2. Of those which are most directly connected with Europe, the most important are in the Mediterranean—in the western Mediterranean, the Balearic Islands, Elba, Corsica, and Sardinia ; in the eastern Mediterranean, the Ionian Islands, the Cyclades, Negropont, and Crete ; in the centre, the Lipari Islands, Sicily, and Malta.
 3. The Channel Islands are the only part of the extensive English possessions in France that still remains under English rule. They are a 'Market-Garden' for early vegetables to the London market.
 4. The Lofoten Islands, off the coast of Norway, are the centre of a very important cod-fishery, because they stand on a sandbank which juts out (south-west of Tromsø) into the deep, cold water of the Arctic Ocean. The meeting off this bank of the cold Arctic air and water with the warm 'Gulf' Drift and south-west 'Anti-Tradés' causes dense fogs and sudden storms. It is this and the heavy tides that has given the Mälstrom such a bad reputation.

Inland Seas.

1. The North Sea is very shallow, and contains a number of sandbanks and sand-choked harbours ; but it is never frozen, even up the coast of Norway.
 1. This is due to the Gulf 'Drift' and the warm south-west winds, which keep the coast line of Europe free from ice even within the Arctic circle.

2. These sandbanks have been formed by the meeting of the two tides which flow round Great Britain, one round the north of Scotland and the other up the English Channel, and which meet off the Thames. Some of them are very dangerous, especially the Goodwins; and some are very useful for fishing, especially the Dogger. Cf. p. 12.
3. These banks have the three great qualifications for a good fishing centre—They are very prolific, being covered with the particular kinds of sea-weed amongst which the fish find their food and lay their eggs; the sea is so small—only about twice as large as the British Isles—that the fishermen have not to go very far from their homes; and, for the same reason, markets are very near, *e.g.* Billingsgate, which supplies London—the largest city in the world.

2. The Baltic Sea is only three-quarters the size of the North Sea, and is landlocked, so that it has no perceptible tide; it is also so shallow that it has very few good harbours.

1. The only really good one is Copenhagen, which stands on the Sound—the shortest and the straightest of the three channels into the Baltic from the Kattegat.
2. The Scandinavian Mountains to the west of it intercept all the warm, wet south-west winds, but send down into it a very large amount of fresh water; and the huge plain of Russia to the east of it exposes it to the cold, dry north-east winds from Siberia.
3. It is therefore more or less ice-bound for four months in the year, during which mails and passengers are sometimes sent across in sledges. Even at Riga, which is in the latitude of Dundee, the harbour has been blocked for nearly three months in the year with a line of icebergs more than thirty feet high and nearly a mile long.
4. The excess of fresh water from the Swedish rivers, and from the deficient evaporation in such a northern latitude, besides making it more liable to freeze, causes a constant outflowing current through the Kattegat.
5. Similar causes—the amount of land around the sea, the shallowness of it, the slowness of the tides, the want of access for the warm winds and of protection against the cold winds—make the White Sea quite useless for commerce during nine months of the year.

3. The Mediterranean presents some strong contrasts to the Baltic Sea, in size, depth, drainage, latitude, and water.

- 1. It is six times as large, and at least one hundred times as deep. Between Malta and Crete, it is about as deep as the Matterhorn mountain is high, whereas the Baltic is very seldom more than fifty feet.**
- 2. Like the Baltic, it is too small and too much landlocked to have a real tide.**
- 3. It gets comparatively little fresh water from rivers, and loses a great deal by the rapid evaporation in such a southern latitude, so that, while the Baltic has a current out through the Kattegat, the Mediterranean has a current in through the Straits of Gibraltar; and, while the Baltic is very fresh, the Mediterranean is very salt.**

4. The Black Sea is nearly as large as the Baltic, and its average depth is nearly as great as that of the Mediterranean.

- 1. Like the Baltic, it receives a very large amount of river water; but, like the Mediterranean, it is in a southern latitude. Consequently, it is more salt than the Baltic, but less salt than the Mediterranean.**
- 2. Its great depth keeps its water very cold; and the huge plains round it expose it to great extremes of temperature, and especially to dry, hot winds in summer. Consequently, like the great lakes of Canada, it is subject to sudden storms and dense fogs.**

5. The Caspian Sea is about the same size as the Black Sea.

- 1. As it has no outlet at all, all its surplus water has to be got rid of by evaporation, and this causes it to be extremely salt.**
- 2. It is also being gradually filled up by the mud brought down by the Volga, as the Sea of Azov is by the mud brought down by the Don. It is nearly 7000 square miles smaller than it was 100 years ago, and this is affecting both its climate and its commercial value.**
- 3. It is probably, like the Sea of Aral, a remnant of a huge sea which connected the Black Sea with the Arctic Ocean, and which separated Europe from Asia. Cf. p. 50.**

General Surface.

1. Two-thirds of Europe consists of a Great Central Plain, which stretches between the Scandinavian Mountains and the system of the Pyrenees, Alps, Carpathians, Balkans, from the Bay of Biscay to the Ural and the Caucasus Mountains.

1. It is so level in its eastern half that it is possible to travel from Cologne to Perm without going through a single tunnel. Most of the commerce in this half, however, is done by river and canal.
2. The western half, from Cologne to Bordeaux, is undulating, and is even broken by hills—the Vosges and the Ardennes; but communication in this half is mostly by rail, though the canal systems, especially in France, are excellent.

2. There are several smaller, but important, plains, some of which form part of the Great Central Plain.

1. In the north-west—*i.e.* the Netherlands—and in the south-east—*i.e.* the Steppes—there are considerable areas of land which are actually below ocean level. Those in the Netherlands have been reclaimed by the energy of the Dutch, and are protected by sand-dunes and granite-dykes. Those in the Steppes are the result of the natural shrinking of the Caspian Sea. Cf. p. 53.
2. The Pushtas of Hungary and the Landes of France are plains of sand, while the Tundras of Northern Russia are frozen plains.

3. Both systems of mountains have the same general direction, which is characteristic of all the chief mountain systems of the Old World, *i.e.* east and west.

1. Besides these two larger systems which run east and west there are five smaller systems which run north and south—the Vosges, the Black Forest, the Urals, the Apennines, and the Pindus range.

N.B.—The systems of the New World run north and south, *e.g.* the Rockies and the Andes. Cf. the Australian and New Zealand Alps.

4. The Scandinavian Mountains run from the Naze to Nordkyn, and consist of two continuous ranges—

the Dovre-field in the south, and the misnamed Kjolen Mountains—which have no *keel*-like ridge—in the north.

1. They are highest and broadest in the south, and consequently it is in the south—*i.e.* the warmest latitude—that they form the greatest obstacle to the warm south-west winds. The highest peaks in the south, Skagstøls Tind and Snehatta, are about twice as high as Ben Lawers or Ben Cruachan.
2. As they are so high and so near the sea, they meet the wet winds at their wettest, and this causes the fall of rain and snow to be heavy. This accounts for the huge glaciers and the innumerable streams that flow from them.

5. The Pyrenees are a double chain of broad, high mountains, which form a practically impassable barrier between France and Spain.

1. All communication by rail between the two countries has to be carried on round the ends of the range, *i.e.* through Bayonne and St. Sebastian or through Perpignan and Barcelona. Cf. Carlisle and Berwick.
2. The two highest peaks, Maladetta and Perdu, are more than three times the height of Snowdon or Schiehallion.

6. The Carpathians form a huge semicircle of nearly 1000 miles in length, protecting Hungary from foes and from the cold north-east winds.

1. Several peaks are twice as high as Snowdon, and the Tatra peak is nearly twice as high as Ben Nevis.
2. The Jablunka Pass is a very useful depression, through which the main line of rail from Buda-Pesth to Breslau goes.

7. The Caucasus is geographically an Asiatic range, but politically it belongs to Europe.

1. Its highest peak, Mount Elbruz, is more than four times the height of Ben Nevis.
2. The Dariel Gorge is a very famous pass by which the Russians invaded and conquered Caucasia.
3. The direction and the great height of the range cause it to have a very marked effect on the climate of the country to the south of it.

8. The Alps are the backbone of Europe. They are

composed of various ranges which circle round the north of Italy, protecting it both from cold winds and from enemies.

1. The valley passes used to be very important, especially those of Mont Cenis, Little St. Bernard (Hannibal's route), Great St. Bernard (the Pilgrim route to Rome), and the Simplon (the first carriage route); and they all converge, like the spokes of a wheel, on Turin. This has made it much easier to invade Italy from France than to invade France from Italy.
2. The importance of the passes has decreased very much since the cutting of four railway tunnels through the mountains. The Mont Cenis tunnel, which is $7\frac{1}{2}$ miles, is the 'Overland Route to India' *via* Turin; the St. Gothard, which is $9\frac{1}{4}$ miles, connects Genoa *via* Milan with Switzerland and the Rhine valley. The Simplon is $12\frac{1}{2}$ miles.
3. Five countries contain parts of the Alps—France, Switzerland, Italy, Germany, and Austria. Mont Blanc, the highest peak, is in France, and is about five times as high as Helvellyn or Ben Lomond; Monte Rosa, which is nearly as high as Mont Blanc, is in Italy; the Matterhorn, which is nearly as high as Monte Rosa, is in Switzerland.

N.B.—All these peaks are in the Pennine range of the Alps.

4. Five important rivers rise in the Alpine glaciers—the Rhine, Rhone, Po, Inn, and Adige. The water-power of these rivers has made Switzerland a manufacturing country in spite of the entire absence of coal.

9. The Vosges and the Black Forest are very similar in situation and character.

1. Both are lower in the north, where they merge in the Great European Plain, than in the south, where they draw near to the Alps; and both are about the same height, their highest peaks being about the height of Ben Nevis.

N.B.—The dark-coloured pines which give the Black Forest its name, supply timber to the shipbuilding yards of Rotterdam and to the toy factories of Nürnberg.

10. The Pindus range and the Apennines similarly resemble each other, and the peaks of both are about the same height—twice as high as Ben Nevis.

1. The Pindus range—under the names of Dinaric Alps, Albanian Mountains, and the Pindus Mountains proper—

runs from the Julian Alps to Cape Matapan ; and it contains three important peaks—Mount Olympus, the home of the Classical gods ; Mount Parnassus, the home of the Classical muses ; and Shar Dagħ, from which the Balkan Mountains strike off due east.

N.B.—The *-pen* in '*Apennine*' is the same as in '*Pennine*' and '*Ben Nevis*.'

11. The Urals are as long as from London to St. Petersburg, but they rise so gently that they are a very slight obstacle to commerce or to the dry east winds.

1. They are divided into three sections—the 'barren' Urals, which stretch from the Gulf of Kara to the source of the Petchora river ; the 'mining' or central Urals, which contain the great trade route from Perm to Ekaterinburg ; the 'forest' Urals in the south, the vegetation of which is probably due to the nearness to the Caspian Sea.

12. The volcanoes of Europe are mostly extinct ; but there is a group of active ones in Italy, and Iceland is in a very disturbed state.

1. The chief Icelandic cone is Hekla, which is rather higher than Ben Nevis ; and the ashes are sometimes carried by the wind over the seven or eight hundred miles that separate it from Ben Nevis.

N.B.—Iceland is also covered with hot springs.

2. Italy has three active cones—Etna, Vesuvius, and Stromboli. Etna—which is twice as high as Ben Nevis—is much the largest and highest volcano in Europe ; Vesuvius, which is not half the height of Etna, is the only active volcano on the mainland of Europe. Its first eruption was also its worst ; Herculaneum and Pompeii, with 200,000 inhabitants, were buried in it, and remained undiscovered for 1500 years.
3. There are extinct volcanoes in many parts of Europe ; and the districts are always important, because volcanic soil is very fertile. The Auvergne district of France and the Cyclades, especially Milos and Santorin, are typical volcanic areas.

Rivers.

1. The general water-parting of Europe runs from the south-west to the north-east, and has two great centres—the Alps and the Valdai Hills.

1. The Alps are very high, and have seas near them on every side except one ; therefore, they have a very heavy rainfall.
2. The Valdai Hills are very low, and are very far from sea except on one side ; therefore, they have a very light rainfall.
3. The rivers which flow from the Valdai area are very long and very slow ; the rivers which flow from the Alpine area are—except the Danube—shorter and much more rapid.

2. The river system of Europe is exceptionally useful for several reasons.

1. The rivers generally run parallel with the mountains,* and do not try to break across them ; and, therefore, they are generally navigable for the greater part of their course.
2. They radiate in all directions from common centres, and the character of the surface allows their lower courses to be interconnected by canals. For instance, the Rhine, Rhone, Ticino (=Po), and Inn (=Danube), all rise within 40 miles of each other, and empty hundreds of miles apart. Both the Black Sea and the Caspian are connected by river and canal with the Baltic ; both the Black Sea and the Baltic with the North Sea ; both the North Sea and the Caspian with the Mediterranean.

3. There are, however, a few drawbacks to this general excellence.

1. The rivers in the south get very little rain in summer, and those in the east get very hard frost in winter.
2. The increase in the size of modern ships necessitates constant dredging, even in rivers that enjoy the 'scouring' advantage of a tide.
3. Many of the short rivers, and some even of the long ones, especially in the Alpine area, are too quick for navigation. In the latter case they may still be useful, however—for irrigation, as in Spain, for mechanical power, as in Switzerland, or for timber-floating, as in Sweden.

* There are two important exceptions to this—the Elbe in the north-west corner of Austria, and the Danube in the south-east corner.

4. The most important rivers of Europe are the Seine, the Rhine, the Elbe, and the Danube. Cf. pp. 66 and 90.

1. The Seine is so useful that Rouen has the best position for trade of any single city in continental Europe. The reasons for this are that the river rises at a low level, and therefore is slow ; it flows through porous soil, which is able to moderate its floods and regulate its volume ; and it is connected by canal with the waterways of neighbouring countries at more than a dozen separate points.
2. Though the Rhine rises in Switzerland, and empties through Holland, it is essentially a German river. It is, however, a really international highway of commerce, with beautiful scenery and a fertile basin ; and it has, therefore, along its banks probably a greater number of important cities for its size than any other river in the world.

N.B.—The older cities, such as Coblenz and Cologne, are all on the left bank, which had the protection of the river itself against the Teutonic hordes of Central Europe.

3. The Elbe has several points of resemblance to the Rhine—it is extremely valuable for commerce, being navigable up to Prague *via* the Moldau ; it does not rise in Germany, but is essentially a German river ; and its upper and middle course is beautiful, while its lower course is dull and uninteresting.
4. The Danube is the longest river in Europe except the Volga, being four times as long as the Seine. Though it rises in Germany, and empties through Roumania, it is essentially an Austrian river ; and it does for the trade of south-eastern Europe what the Rhine does for the trade of north-western Europe. Like the Rhine, it has deposited a large, damp delta ; but, unlike the Rhine, it has no tide to help in keeping its mouth free from mud. Like the Rhine, too, it has a very fertile basin—famous at different places for timber, wine, grain, and pigs.

N.B.—The old obstruction of the 'Iron Gates' at Orsova has been largely removed by the cutting of a ship-canal through the solid rock.

Lakes.

1. There are two great lake-regions in Europe, one round the Alps and the other round the Baltic Sea.

1. Both groups act as reservoirs for rivers, and the Alpine lakes act also as valuable filters.

2. The Baltic lakes are very large and very low, while the Alpine lakes are at a considerable height and quite small.
 3. The Alpine lakes are comparatively much the deeper of the two, and have the advantage of being set amidst magnificent snow-clad mountains.
2. The Alpine lakes are practically confined to Switzerland and Italy.
1. The largest Italian lake is Garda, which is about five times as large as Loch Lomond ; the largest Swiss lake is Geneva, which is about eight times as large as Loch Lomond, or more than twice the size of Lough Neagh.
 2. Geneva acts as a filter for the Rhone, as Constance does for the Rhine and as Maggiore and Como do for tributaries of the Po.
 3. Of the other lakes connected with the Rhine, Neuchâtel is twice the size of Lucerne, *i.e.* three times the size of Loch Lomond.
- N.B.*—Loch Lomond = 4 Windermere, and Lough Neagh = 11 Windermere.
3. The Baltic lakes are partly in Sweden and partly in Russia.
1. Ladoga, Onega, and Wener are the largest. Ladoga is as large as Wales ; Onega is half, and Wener one-third, the size of Ladoga. Wener is ten times as large as Geneva, and twelve times as large as Constance.
- N.B.*—It is *via* these lakes that the Baltic is joined to the Caspian. Cf. p. 58.

Climate.

1. The effect of the mountains on the climate may be illustrated in several ways. (Cf. p. 5, etc.)
 1. The peaks of the Maritime Alps are covered with perpetual snow, though the Riviera lies at their base ; and there are 'belts' of vegetation up their sides changing, with the height, from fields of grain to forests of deciduous trees, from deciduous trees to cone-bearing, from cone-bearing trees to pasture, and from pasture to perpetual snow.
 2. The Alps shelter Lombardy, as the Carpathians shelter Hungary, and the Caucasus shelter the valley of the Kur. Constantinople and Naples are both on the sea-level, and

in the same latitude; but Naples is 10° warmer than Constantinople in winter, because the Apennines shelter it from the cold north-east winds.

2. The effect of the sea may also be illustrated in several ways.

1. The difference between summer and winter temperature at Hammerfest is 27°; that at Moscow 54°, although Moscow is 1000 miles farther south than Hammerfest.
2. The average rainfall is over 40 inches in Western Europe, but under 20 inches in Eastern Europe; at Bergen the rainfall is over 7 feet a year, while at St. Petersburg it is under 2 feet.
3. The position of Antwerp may be compared with that of Odessa, except in latitude, and—thanks mainly to the ‘Gulf’ Drift—they have the same average temperature, though Antwerp is more than 400 miles the farther north.

N.B.—Where warm and cold currents meet, as off the Newfoundland banks or the Mälstrom, there are constant fogs.

4. The distinct warm current of the Gulf Stream merges in a general drift of warm surface-water from the Equator towards the Poles. In the North Atlantic this drift is deflected to the coast of Europe, partly by the rotation of the earth and partly by the south-west Anti-Trade winds.
5. These winds are of enormous importance for the carrying of moisture inland. This is very advantageous for spinning, but not good for making flour. Thus, the spinners of Pilsen and Brünn need to charge their mills with vapour artificially in order to compete with those of Manchester and Leeds, but English millers cannot make good ‘Hungarian’ flour even from the best Hungarian wheat.

It has also a marked effect on vegetation. Thus, the wet side of nearly all the mountains produces timber, while the dry side produces pasture; the dry climates produce grains, while the damper ones produce roots, *e.g.* Norwegian pine and Silesian wool, Pomeranian potatoes and Hungarian wheat.

Vegetation.

1. The vegetation of Europe may be roughly classified under three heads: the Arctic Region, the Mediterranean, the Intermediate.

1. The Arctic Region is practically the Tundras, and produces only mosses and lichens. These produce sufficient food for reindeer.
2. The Mediterranean is the region of dry, sunny peninsulas and islands. The characteristic plants of the peninsulas have leaves or roots specially suited to drought; the characteristic plants of the islands and of the coastlines of the peninsulas are fruits, *e.g.* Maltese oranges, Sicilian lemons, Corfu citrons, Barcelona nuts, Greek currants, Almerian grapes, 'Sultana' raisins, Turkish figs, Servian plums, Tuscan olives.

N.B.—Laurels and other evergreens have thick leaves in which to store water, and vines have long roots with which to draw up water from great depths.

3. Between the Arctic mosses and the Mediterranean evergreens there is the Intermediate region, which is more or less a region of deciduous trees and the ordinary grains and the vine. The chief trees are the oak, beech, and ash; the chief grains are wheat, oats, and rye. The vine is grown largely—for wine—on the sunny slopes throughout Central Europe, *e.g.* at Tokay, Epernay, Reims, etc. Fibres, such as flax and hemp, flourish on the sites of old forests throughout this region, which have been manured for centuries with the fibrous mould of the fallen leaves, *e.g.* in Russia and the Low Countries.

Minerals.

1. Continental Europe is rich in minerals, especially coal and iron; and these are the two most important minerals, because they supply fuel and machinery.

1. The coal-fields in Europe are small and scattered, and the seams, though numerous, are thin and hard to get at; and this affects the price of the coal. But, fortunately, in most cases the coal is found quite close to the iron and to limestone (for 'flux' in smelting).
2. The coal is mined in the largest quantities in Germany, France, Belgium, and Austria,—Germany producing more than twice as much as the other three together, though her output is not half that of Great Britain.
3. The largest amount of iron at present is mined in Germany and France, but the richest ores are in Sweden, Spain, and East Russia.

N.B.—Belgium is an important manufacturer of iron, but has to import ore; and Russia has very large coalfields, but they are not worked yet. Cf. p. 85.

2. Amongst the other minerals, in the more strict sense of the word, are oil, china-clay, silica, and salt.

1. The oil comes chiefly from the Caucasus district, especially from Baku, where it is extremely useful as fuel for the steamers on the Caspian Sea. It is also fairly abundant in Galicia and Bukowina.
2. The china-clay, or kaolin, is found chiefly in Saxony and France, especially near Dresden, Sèvres, and Limoges.
3. The silica—for glass-making—is very widely spread, but the most important deposits are in Bohemia and Belgium. There are also rich deposits near Venice and near Paris.
4. Salt—for food, agriculture, and chemicals—is evaporated round the coasts of France and Spain, quarried all over the Steppes of Russia, and mined on a gigantic scale in Austria, especially near Cracow.

3. Amongst the other metals, copper, lead, zinc, gold, silver, and mercury are most important.

1. Spain and Sweden produce the best copper; Germany, their only rival, produces about a quarter of the amount produced by Spain.
2. Spain is much the largest producer of lead, with Germany second.
3. Germany produces half the zinc in the whole world, and there are also large deposits of the metal in the corner of Belgium which touches Germany.
4. The 'precious' metals are practically monopolised by Russia and Germany, Russia producing nearly all the gold, and Germany producing the larger part of the silver.

N.B.—Hungary produces some gold, but Russia produces seventeen times as much; and France, Austria, and Spain produce some silver, but Germany produces more than all the three together.

5. Mercury is found in Spain at Almaden, and in Austria at Idria; and the Idrian supplies are very useful in connection with the Hungarian Gold.

N.B.—The reason why Spain, though comparatively a small country, produces such a variety of metals, is that its mountains are of very varied age and character.

Fauna.

1. Europe is well provided with animals, birds, and fish.

1. Cattle are most numerous in Russia and Germany, but most important in Denmark and Holland.
2. Sheep are most numerous in Russia and France, but the best wool comes from Spain and Germany (Saxony and Silesia).
3. Horses are more numerous in Russia than in all the rest of Europe ; but the Flemish and Andalusian breeds are very famous, and Austria-Hungary raises a large number.
4. Pigs are most numerous in Russia and Germany, but they are very important in the Lower Danube basin, especially in Servia.
5. Reindeer are used as beasts of burden round the White Sea, camels round the Caspian, and donkeys round the Mediterranean.
6. The most valuable of the 'economic' birds is probably the eider-duck ; the sweetest songster is the nightingale.
7. Cod and herring are caught in the North Sea, tunny and sardines in the Mediterranean ; salmon are caught in the north-western rivers, and sturgeon in the south-eastern ; the most famous oysters are those of Arcachon and Brittany, or Ostend and Texel. Cf. p. 73.

FRANCE.**Surroundings.**

1. THE three coasts of France have great commercial, naval, and climatic value.

1. As two of them are continuous, meeting towards the open ocean, Brest has a splendid strategic position from which to watch both coasts ; and Brittany gets a heavy rainfall, and turns out first-rate sailors. The Mediterranean, though an inland sea, has been converted by the Suez Canal into one of the main trade routes of the world.

2. On the other hand, the Bay of Biscay and the Gulf of Lions are very stormy: and a large part of the coast, especially between the Gironde and the Adour, is very regular and unbroken. Consequently, there are very few really good harbours. Most of the harbours, though very useful, are either artificial or only river ports, and not one of them stands on a coal-field.
 3. The most useful harbours are: Havre, Rouen, Cherbourg, Dieppe, Boulogne, Calais, and Dunkirk on the north; Brest, Nantes, St. Nazaire, Pauillac, and Bordeaux on the west; Cette, Marseilles, and Toulon on the south.
 2. The land boundaries of France are mountains everywhere except in the north-east.
 1. The weak points are the joints between the different ranges, which are generally marked by a river valley. Thus, the Moselle valley separates the Ardennes from the Vosges, and Nancy guards the passage, with Metz opposite to it; the Doubs valley separates the Vosges from the Jura, and Belfort guards it, its German rival being Strassburg; and the Rhone valley separates the Jura from the Alps. In the latter case, however, the physical obstacles are so great that easy communication was quite impossible until the Alps had been tunnelled. Cf. p. 89.
- N.B.*—The 'Orient Express' to Vienna and Constantinople goes *via* Nancy, and the 'Overland Route' to India goes through the Mont Cenis Tunnel.
3. The want of mountains in the north-east has been most beneficial to commerce, but disastrous to political peace.
 1. This is the worst place to be exposed, owing to the hostility between the French and the Germans. Sedan, Mons, Jemappes, Fontenoy, and many other battlefields, lie along the unprotected frontier.
 2. Belgium does more trade with France than any other country in the world except Great Britain; and the Lille and Roubaix district is the busiest manufacturing centre in France.

Surface, Climate, and Productions.

1. France slopes down from the south-east to the north-west; and it may be divided into two nearly equal parts by a line from Bayonne to Sedan.

1. North-west of this line the country is generally low and flat, forming part of the Great European Plain ; south-east of it there is a mass of mountains and plateau—the Cevennes and Auvergne.
2. Most of the rivers follow the general slope of the country, and flow to the north-west ; and any which flow contrary to the general slope, are usually too rapid to be good for navigation. Cf. p. 4.
3. In the north-west corner there are the hills of Brittany, and in the south-west corner the Landes.

N.B.—These Landes are a desert, formed by the sand which is blown inland from the dunes along the coast. The planting of coarse grass on the dunes, and of fir trees to the east of them, is gradually stopping the passage of the sand inland.

2. The Seine is much the most important river.

1. It is navigable to Troyes, and is connected with an immense area by its tributaries—especially the Marne and the Yonne—and by dependent canals.
2. The Loire is navigable to above its junction with the Allier, and the Garonne to Toulouse ; but both are subject to terrible floods.
3. The Rhone itself is of very little use for navigation, but its northern tributaries—the Saone and the Doubs—are extremely useful.

3. The soil and the climate vary considerably in different places, and therefore the vegetation varies.

1. Generally speaking, the climate is temperate, and the soil is fertile. Of course, Brittany is damper than the basin of the Garonne, which is protected from the south-west winds by the Pyrenees, or than the basin of the Marne, which is farther from the sea. So, too, the plain of Normandy, which is exposed to the dry east wind, has much greater extremes of climate than the sheltered Rhone valley has.
2. The chalk slopes of Champagne are less fertile and less warm than the volcanic slopes of Guienne ; but champagne is made from grapes which are not perfectly ripened.

4. The vegetation corresponds roughly to three climatic belts.

1. For about 100 miles inland from the English Channel there is a belt of pasture and orchards almost right across the

country (cf. Normandy pippins and butter, Camembert cheese, and the wool industry of Reims).

2. In the dampish heat of the lower Rhone valley, maize, mulberry, and olives flourish (cf. the oil of Provence and the silk of Lyons).
3. The rest of the country produces wheat and wine—wheat on the dry, warm plains in the basins of the Seine and the Loire, and wine on the dry, warm slopes of Champagne, Burgundy, and Guienne. Cf. p. 62.

N.B.—Reims, Sillery, and Epernay are in Champagne; Dijon, Macon, and Beaune, in Burgundy; and Medoc, St. Emilion, Sauterne, and Cognac are near Bordeaux.

4. The valley of the Garonne produces all sorts of fibres—flax, hemp, and tobacco; and flax and hemp are produced also in the Sarthe valley.
5. The chief roots are potatoes and beet, the potatoes mainly in the west, and the beet on the north-east coal-field, where it can be easily converted into sugar and alcohol.
6. Forests cover most of the hilly districts, especially the west, *i.e.* the wetter, side of the mountain ranges.
5. The chief minerals are coal, iron, and salt.
 1. The coal comes almost entirely from the Belgian frontier, especially from round Valenciennes, and from the eastern highlands, especially from round Creuzot and St. Etienne.
 2. The latter is the only part of France where coal and iron are found together, but there are rich deposits of iron in the upper Moselle valley, especially round Nancy and Chavigny.
 3. Nancy is also the great producer of rock-salt; but large quantities of salt come from the brine-pans along the coast, especially between the Loire and the Gironde and between Cete and Marseilles.

Towns and Industries.

1. The largest towns and industries are generally on or very near the coal-fields; but, owing to the scarcity of coal, the French manufactures are much scattered, and half the population is engaged in agriculture.

2. The textiles include woollens, silks, linens, and cottons.

1. The woollens are made on or near the coal-fields of the sheep districts, from Tourcoing to Reims, and from Sedan to Amiens; but the great centre is Roubaix.
2. The silks are made on or near the coal-fields of the mulberry district, from Lyons and St. Etienne to Nimes and Avignon.
3. The linens are made on the coal-fields nearest to the Belgian flax district, especially at Lille and Cambrai. Some linen is also made in the flax district of the Sarthe valley, where there is a little coal at Le Mans.
4. Rouen is the centre of the cotton industry, but imports British coal.
5. Lace and ribbons are specialities. The lace comes mainly from Valenciennes, and the ribbons from St. Etienne.
3. Iron, glass, china, and leather goods are also important, and are chiefly made on the coal- and iron-fields, especially at Creuzot and St. Etienne.

1. Creuzot specialises in railway plant; St. Etienne specialises in bottles; Limoges and Sèvres (Paris) produce the best china, and leathern goods are made in the Seine and the Rhone valleys, where skins are easily imported. Paris and Marseilles specialise in shoes, while Grenoble, amongst the spurs of the Alps, specialises in real *kid* gloves.

N.B.—A magnificent system of railways and canals connects all these districts with one another and with the seaports.

4. France had fifteen towns with a population of 100,000 and upwards (Census, 1901).

1. Paris is the largest city on the continent of Europe, being very nearly half the size of London. It is the emporium of all sorts of French goods, especially artistic; and it is the focus of all the foreign and the domestic trade of France. Railways radiate from it to every point of the compass—Lille and Calais, Dieppe and Havre, Cherbourg and Brest, Nantes and Bordeaux, Toulouse and Marseilles, Belfort and Nancy. (Paris to Constantinople, 1900 miles in 63 hours.)
2. The population of Marseilles is just under 500,000, and that of Lyons is just over 450,000; *i.e.* they may be compared with Birmingham and Leeds respectively.

The suitability of the water for dyeing, the suitability of the soil and climate for mulberry growing, and the nearness of the St. Etienne fuel and machinery, have made Lyons the chief silk centre of Europe. Cf. p. 115.

Marseilles is the chief harbour of France, and monopolises the Mediterranean and the Pacific trade. Its Mediterranean trade includes a grain trade with the Black Sea, and a grain and wine trade with Algiers; and its Eastern trade has developed the oil and silk industries—which sprang up naturally in an olive and mulberry country—by large imports of Indian oil-seeds and Chinese silk.

N.B.—In connection with this oil industry, there are very important soap, scent, and candle industries.

3. Bordeaux is rather more than half the size of Marseilles, *i.e.* about the size of Hull or Nottingham. It is the great wine port of France, and commands the trade of the Garonne basin; but the silting-up of the river and the increased size of modern vessels are attracting trade to the outport Pauillac.

N.B.—Lille is the same size as Leicester or Salford, *i.e.* nearly as large as Bordeaux. Cf. §2 (3) above.

4. Toulouse, which is the size of Aberdeen (cf. pp. 67 and 68), is the centre of all the trade—by rail and canal—across the south of France from the Atlantic to the Mediterranean. It is also the headquarters of the tobacco factories. Cf. p. 67.
5. St. Etienne and Nantes are nearly as large as Toulouse. Nantes commands the sea approach to the plain of the Lower Loire, which has been one of the great battlefields of France (cf. Tours, Poitiers, Orleans); but, as a port, it has been supplanted by the outport of St. Nazaire—in spite of its ship-canal.
6. Havre, Roubaix, and Rouen are all about the size of Brighton or Oldham; and Reims is the size of Derby or Norwich.

Havre is the principal port in the north of France, and has hitherto practically monopolised the North Atlantic trade. It is the old port of Paris—a city with two and a half million inhabitants. Its nearness to the Valenciennes coal-field has drawn to it almost the entire raw cotton trade of the country; and the cotton trade has brought to it also other trades characteristic of the cotton area of North America, *e.g.* cacao and coffee.

N.B.—The Seine brings down so much mud that the harbour is troubled with shifting sandbanks.

Rouen, however, has become a very serious rival of Havre since the Seine was deepened in 1887. It is the 'Manchester' of France, as Havre is the 'Liverpool,' the centre of the canal system of France, and the junction of the three great northern railways. Cf. p. 59.

7. Cette and Toulon are dependent harbours of Marseilles. Toulon is a good natural harbour, which has been strongly fortified as a naval station. Cette is a commercial harbour, which is connected with Bordeaux by canal, and this gives it a large through-trade in wine, grain, timber.
8. The 'Cross-Channel' service from Newhaven, Folkestone, and Dover, to Dieppe, Boulogne, and Calais, was primarily intended only for mails and passengers; but the speed attracted trade in perishable goods such as fresh fruit, cut flowers, and eggs. St. Malo, guarded by the naval station of Cherbourg, does a somewhat similar trade with Southampton. Dunkirk, from its nearness to the Valenciennes coal-field and to the wool area of the Ardennes hills, has become the great wool port. It imports large supplies from the Argentine.
9. Along the Riviera there is a number of towns which are well known as health resorts, *e.g.* Nice, Cannes, Mentone, Monte Carlo. Nice, like Toulon and Nancy, had just over 100,000 inhabitants in 1901.

N.B.—Ajaccio, the birthplace of Napoleon Bonaparte, is in Corsica, which belongs to France.

BELGIUM.

Surroundings and Surface.

1. Belgium has only forty miles of sea-coast, and that little is flat and unbroken.
 1. The sea is kept out by the natural sand-dunes, or by artificial stone dykes; and there are no harbours along it except Ostend, which is merely a packet station. The country has, however, a magnificent river port in Antwerp, and a large canal port in Ghent; and the low sandy shore is a splendid site for watering-places.
2. The land boundaries of Belgium are flat, and offer no obstacle to commerce or enemies.
 1. Belgium has immense natural advantages for doing a transit trade between France and Central Europe, and between

Great Britain and Central Europe ; but it has suffered terribly from being a 'Buffer State' between France and Germany.

3. Belgium is the smallest country in Europe except Montenegro, and the greater part of Belgium is quite flat, but in the south and east there are the Ardennes Hills.

1. The average height of the Ardennes is about that of the Cotswolds.
2. The Polders are fertile pastures in the north-west, which have been reclaimed from the sea, and are protected by the dykes ; the Campine is an area of marsh and heath in the north-east, which has been drained and cultivated.

N.B.—The soil is naturally sandy, but it has been made fertile by very careful spade cultivation. Cf. p. 79.

3. The Scheldt and the Maas, the two chief rivers of Belgium, are deep and navigable, but their commercial value might be affected by the fact that they empty through Holland.
4. The country is too small and too level to have much variety of climate ; but, of course, the west is rather damper than the east.
1. No part of the country is high enough to make the rainfall heavy ; and all of it is more or less exposed to the extremes of a continental climate, and has very severe winters.

5. There is pasture all over the country, especially for cattle down in the Campine, and for sheep up on the slopes of the Ardennes ; and the agriculture includes grain, fibres, and roots.

1. The best Belgian butter comes from the Campine ; Verviers is the Leeds of Belgium ; and Flanders and Brabant are famous for horses.
2. Beetroot is grown on the coal-field—for sugar ; flax of excellent quality is grown in Flanders, especially in the Lys valley, from Courtrai to Ghent, where the water is free from lime salts, and where both soil and climate are suitable ; wheat is grown in the driest parts of the plain—*i.e.* the centre—and rye in the damper parts—*i.e.* the Campine and the Scheldt basin. Cf. p. 4.

6. The chief minerals, which are naturally in the hills, are coal, iron, and zinc.

1. The zinc is round Verviers ; the iron is fortunately found on the coal-field in the Maas valley, especially round Liège and Namur ; and the coalfield is a continuation of the Valenciennes field (cf. p. 67), and stretches right across the country from near Fontenoy to Verviers—the chief centres being in the Sambre valley, especially round Mons and Charleroi.

N.B.—There is also good iron in the independent Grand Duchy of Luxemburg.

7. Belgium is essentially a mining and manufacturing country ; and four towns had more than 100,000 inhabitants in 1904—Brussels, Antwerp, Liège, and Ghent.

1. Brussels is the centre of a network of railways and canals, by which it collects the flax, wool, and coal for its lace and carpet industries. It is rather larger than Manchester.
2. Antwerp is just half the size of Brussels, *i.e.* about the size of Edinburgh or Bradford. With the North Sea in front of it, a splendid harbour, and a magnificent rail and canal system behind it, it has become one of the greatest of all continental ports. Cf. p. 70.
3. Liège, with its suburb Seraing, is nearly the size of Newcastle; and, like Newcastle, it is famous for glass, chemicals, coal, and machinery (especially cannon).
4. Ghent, which is just the size of Dundee, is, like Dundee, famous for linen. It is also famous as the 'Manchester' of Belgium, for it can import cotton easily *via* the Scheldt.
5. Amongst the numerous small towns which make Belgium the most densely-populated part of Europe, are Mechlin and Bruges. They are about the size of Bath or Yarmouth, and are both famous for lace. Mechlin (Malines) is also the centre of the Belgian railways.

HOLLAND.

Surroundings.

1. The coast-line on both sides of Holland is very broken and very low.

1. The chief openings, the Zuider Zee and the Dollart Zee, were made by the sea breaking over the low coast-line (at the end of the thirteenth century); and much of the coast is still below sea-level, but is protected by natural sand-dunes and artificial stone dykes.
2. Part of the old coast remains in the form of a line of islands in the north-west, the largest of which is Texel.
3. The mouths of the Scheldt, Maas, and Rhine are also studded with islands, *e.g.* Walcheren. This is the ideal situation for oysters—if the water is clean—as the rivers bring down the necessary percentage of fresh water and the alluvial mud, and the islands give the necessary protection against the violence of the North Sea. Of course the Zuider Zee is also very suitable, but it is being drained. Cf. p. 64.

N.B.—The rivers are dyked, as well as the coast—for fear of floods, because their beds become raised up to the level of the surrounding country by the amount of mud which they bring down.

2. As the land surroundings of Holland are absolutely flat, they give every possible facility for commerce by rail, river, and canal.

1. This exposes the country to the 'continental' winds—which make the winters very severe—and to invasion.

N.B.—In summer the large amount of water makes the climate 'insular.'

3. The surface is also absolutely flat, being practically the delta of the Rhine.

1. This is an immense advantage for communication, though it makes river floods very dangerous.
2. It makes the winds regular, so that windmills are very useful and correspondingly numerous.

3. It makes part of the country naturally marshy, which causes constant fogs and marsh fevers, but these 'polders' when drained, become, as in Belgium, very fertile.
4. In such a climate and on such a soil, the vegetation is naturally limited to grass, hardy grains, roots, and fibres; and there are no minerals except peat and pottery clay.

1. Dairy industries suit a country like Holland, which has very important colonies—*e.g.* in the East Indies—to attract its *male* population to commerce. Enormous quantities of butter and cheese are exported, *e.g.* from round Groningen, and there is a large tanning industry.
2. Rye is the chief grain, and is used in distilling the famous Hollands gin at Schiedam; the roots are both vegetable and flower—mainly potatoes and 'Dutch Bulbs'—Haarlem being the centre for both; and there is a large export of flax for the Belgian lace industries, Haarlem and Tilburg being also famous for 'brown *Holland*.'
3. The clay has made Delft famous for 'Delf'; clay is also used in making the roads, which often run along the top of the dykes, as the canals do. The peat is along the German frontier.

5. Four towns—Rotterdam, Amsterdam, the Hague, and Utrecht—had more than 100,000 inhabitants in 1904.

1. Rotterdam is nearly the size of Bristol. Like Bristol, it is a river port, but it has been connected with the North Sea by a fine ship-canal. It commands the trade of the Rhine (*via* the Waal) as well as that of the Maas. Like Bristol, too, it has a large trade in sugar, tobacco, and cacao.
2. Amsterdam is much larger than Rotterdam, but is not quite such a good harbour. It is built on ninety-five islands at the mouth of the Amstel; but, as the Zuider Zee is very shallow, a ship-canal has been cut direct to the North Sea. It is the chief manufacturing centre of Holland; it has splendid communication inland by rail and canal, and it is especially famous as a coffee and a diamond market.

N.B.—The Dutch connection with South Africa, and religious toleration for Jews, gave it its diamond industry.

3. Hague, though as large as Leicester, has only political importance; Utrecht, which is the size of Preston or Willesden, is the great railway centre of Holland; and Flushing and the Hook are packet stations.

SCANDINAVIA.

Surroundings and Surface.

1. The coast-line of Scandinavia is extremely irregular, especially on the Norwegian side.

1. The main reason for this is the number of long inlets, called fiords, which have been made by the torrents that tear down the sides of the mountains. Cf. p. 19.

2. The chief fiords are those of Christiania, Stavanger, Hardanger, Sogne, and Trondhjem, which form splendid harbours, because the inshore water is kept practically calm at all times by a line of islands, *e.g.* the Lofoten and Vigten Islands. Cf. p. 51.

3. The two coasts have some marked differences:—The west coast is on the open ocean while the east is on an inland sea; the west is protected by the mountain mass of Scandinavia from the icy east winds, the east is cut off by it from the warm west winds; the skerries, or belt of islands, on the west are continuous from the Naze to the North Cape, and are very rugged, while the islands on the east are low and sandy, and very much scattered.

N.B.—For the characteristics of the North Sea and the Baltic, cf. p. 51.

4. The most important harbours are Christiania and Göteborg, followed by Bergen and Stockholm.

Christiania, which was about the size of Leicester in 1900, has a very important coasting and cross-sea trade; but it is usually frozen up for four months every year.

Göteborg, which was the size of Oldham in 1904, owes its importance partly to its sea-approach, and partly to its inland communication with Stockholm *via* the Gota Canal.

Stockholm, though less important than Göteborg, is more than twice as large, being about the size of Edinburgh. Like Amsterdam or Venice, it is built on a number of islands. It is ice-bound for a third of the year.

Bergen, a little town the size of Cork or Devonport, is an extremely important harbour, being the centre of the great

cod and herring fishery, and being open the whole year through.

Among the smaller ports, Malmö, Trondhjem, and Hammerfest are the most important; Frederikstad and Drammen are timber ports; and Carlskröna is a naval station. Many of them are very famous for salmon.

2. The surface is a huge tableland, with a steep descent towards the North Sea and a gradual descent towards the Baltic.

1. The average height for several hundred miles is that of Ben Nevis, and the chief peaks are nearly twice as high.
2. The steepness of the Norwegian side, its height, and its nearness to the sea—added to the warmth of the Gulf Stream, and the distance to which the fiords penetrate the land—cause the extremely heavy and sudden rain which is really responsible for the fiords.
3. The Swedish side drops gradually in three distinct terraces. The highest terrace is a belt of forest; among the hills of the second terrace is a belt of mineral wealth; and the lowest terrace is cultivated.

3. The largest rivers are the Glommen, the Gota, and the Dal.

1. The Baltic rivers are much longer and slower, as a rule, than the North Sea rivers; but the Gota is the only river of any importance for navigation, and it is connected by canal with Lakes Wener and Wetter.
2. The Norwegian rivers have an enormous value—as yet almost untouched—for mechanical power; and the coastal climate is well suited to spinning and weaving.
3. The Swedish rivers have considerable value for the same purpose, but the Swedish climate is much more continental. The chief value of the Swedish rivers is for floating timber.

4. The climate over such a large area, with such a varied surface, naturally varies very much; but everywhere the latitude and the height of the plateau make the cold very great.

1. Of course, Norway is sheltered by the mountain mass to the east of it, and it is much moister, and therefore has a much

more even climate, than Sweden. For instance, Bergen is five times as wet as Upsala; and no part of Norway has such an intensely severe winter as Swedish Lapland has.

2. The only useful soil, under such circumstances, must be what has 'weathered' from the mountains, and been washed down on to the lower levels; and in Norway, as the mountains are actually on the coast, the only available soil is along the sides of the fiords.

Industries and Towns.

1. The vegetation consists mainly of timber, grass, oats, and roots.

1. There are enormous forests of pine and fir, which supply deals and such subsidiary products as pitch, tar, matches, and wood-pulp (for paper). The chief centres are Christiania, Drammen, Gefle, Göteborg, Stockholm, and Jönköping.

N.B.—The presence of wood and sulphur round Göteborg account for its very large match trade.

2. Oats for export are raised in large quantities in Gothland, and rye is grown for home consumption—in the form of black bread.
3. The most valuable pastures are on the peninsula of Gothland, from which there is a large export of butter; but in summer the cattle are fed far up the mountain valleys, as in Switzerland.

N.B.—The greater rainfall of Norway causes the forests to come much lower down into the pasture area than in Sweden.

4. The chief roots are potatoes and beetroot—the latter for sugar.

2. The mining district is in Dal-Arne, and the two chief mineral products are iron and copper.

1. The iron of Dannemora, which is smelted with charcoal, is supremely good for steel, and is largely exported to Sheffield. The iron of Gellivare is not quite so good, and is in a very high latitude; but it has a railway to Lulea and Boden, and abundance of timber for charcoal.

2. The copper comes from Fahlun ; and there are also some silver and lead mines at Sala.

N.B.—These iron-works, like the textile factories at Norrköping, owe their existence to the Lake-Canal System which connects the Gulf of Bothnia with the Kattegat. Of course, traffic is stopped by frost in winter ; and there are heavy storms in summer, for the lakes lie in a low east-and-west plain, up which the S.W. winds rage between the higher land to the north and the south.

3. As the wealth of Norway consists entirely in fish and forests, there are very few towns ; and of the few only one, Christiania (228,000), has more than 100,000 inhabitants.

1. The fishing centres are generally little towns or villages, like Trondhjem, Stavanger, Tromsø, and Hammerfest. Trondhjem, which is exactly the same size as Canterbury, is, like Canterbury, a great ecclesiastical metropolis, and has a very old cathedral ; it is also the northern terminus of the railways.
2. The recent separation of the two kingdoms reflects a fundamental difference of character, the Norwegians being essentially maritime and democratic, whilst the Swedes are military and aristocratic.

4. The industries of Sweden vary, but, as in Norway, want of coal and scarcity of population are great drawbacks.

1. The chief industries are connected with forests in the north, mining in the centre, and agriculture in the south.
2. Gefle, which is the same size as Trondhjem or Stavanger, is the centre of the timber industries. It exports regular timber for masts, beams, rafters, etc. ; forest products, such as potash, pitch, tar, and turpentine ; and leaves, bark, lichen, and pith, for cattle fodder.

This district contains the important centres of Stockholm and Upsala, and some important iron-works at Eskilstuna.

3. The densest population is, however, in the southern peninsula, which has special advantages in its level and latitude, the presence of water on practically every side, and its proximity to markets. Consequently, it contains the chief port of the country, Göteborg ; the chief packet station, Malmö ; the chief match centre, Jönköping ; the chief textile centre, Norrköping ; the chief arsenal, Carlskröna ; and the chief fortress, Helsingborg. It has also the only coal-mines, at Scania.

DENMARK.

1. DENMARK is practically an island kingdom, as it has only 50 miles of land boundary—along the frontier of Schleswig. Cf. p. 87.

1. The land boundary is unprotected, but the peninsula of Jutland is much less important than the islands; and, as the chief islands, Zealand, Funen, Laaland, stretch right across the entrance to the Baltic, the commercial and strategic importance of the position is enormous.
2. Of the strips of water which divide up the country, the Great Belt is the only one deep enough for men-of-war, but Denmark dare not use her position against Russia and Germany. The Little Belt is too shallow, too crooked, and too narrow to be of any importance, either commercial or strategic; but the Sound is very straight, and broad enough and deep enough for all the merchant shipping of the Baltic.
3. The coast of the North Sea is, like that of Holland, an unbroken stretch of sandbanks; and, as in Holland, the sea has more than once broken into the country. Indeed, it was in this way that the Liim Fiord was made, and consequently there are dykes in some places.

N.B.—There are no good harbours, which is a great pity, as the North Sea never freezes; but Esbjen ships cattle.

2. Denmark has an area only twice as large as Wales; and a considerable portion even of this is moor and sand-dunes, especially in the extreme west.

1. The islands form one-third of the whole, and none of its scattered portions are large enough to have a river of any size.
2. With the exception of Bornholm, both the insular and peninsular surface is flat. This greatly aids both traffic and cultivation, but there are many marshes and small lakes.
3. The soil is sandy, but has been made fertile by careful cultivation, though formerly wasteful destruction of the fine beech forests along the west coast of Jutland allowed the sand to blow inland, as on the French Landes, and thus to spoil some large stretches of useful land. Cf. p. 66.

3. The climate is insular as long as the Baltic remains unfrozen ; but, as soon as the sea is frozen over, Denmark is exposed to the full continental violence of the east wind.

1. The low elevation makes the rainfall slight ; but the warm south-west winds cause fogs when they meet the cold water of the Baltic or the cold east winds from Siberia.
2. Under these circumstances, pasture is more profitable than agriculture, though a good deal of oats and barley (for brewing) is grown ; but the small size of the farms is adverse to scientific agriculture, though very favourable to dairy and poultry farming. Indeed, Denmark makes the best butter in the world—at least 200 of the dairies being co-operative.
3. About 1,000,000 cattle, 1,000,000 sheep, and 150,000,000 eggs are exported to Great Britain alone every year. A considerable quantity of wool and skins is also exported ; but there are woollen factories both at Odense and at Copenhagen, and glove factories at Randers.
4. The chief towns (except Odense ; 40,000 in 1901) are all harbours—Copenhagen, Aarhus, Randers, and Aalborg.

1. Copenhagen, which is about the same size as Dublin, is a magnificent harbour, and commands the whole trade of the Baltic. It is a dozen times as large as any other town in the country, being—with suburbs—even larger than Leeds.
2. Aarhus, a grain and cattle port commanding the Great Belt, is a little town about the size of Lancaster or Colchester ; and Aalborg, a canal port where the Liim Fiord is narrow enough to be easily bridged, is no larger than Winchester or Hereford.
3. Elsinore commands the Sound ; Fredericia commands the Little Belt ; Korsör is a packet station ; and there are innumerable fishing villages, *e.g.* Skagen.
5. Iceland is as large as Ireland, but does not contain as many persons as Cork.

1. The climate is comparatively mild, but wet and very stormy ; the wealth, as in the Faroe or 'Sheep' islands, is confined practically to sheep, fish, and sea-birds, especially eider-duck.

RUSSIA.

Surroundings.

1. **ALTHOUGH** European Russia has *some* sea on every side, they are all inland seas, and have the usual disadvantages of inland seas in respect of climate and commerce. Therefore, Russia *must* get a port on the Mediterranean !

1. The White Sea is merely an arm of the Arctic Ocean, and the latter is of very little value for commerce, being practically an inland sea between Nordkyn and Novaya Zemlya. The Baltic and the Black, though independent seas, are terribly shut in ; and the Caspian is simply a huge lake.

2. On the White Sea the only harbour is Archangel, a little town the size of Perth or Lancaster.

1. It is the oldest of Russian ports, having been the first of them to trade with England—in the days before Russia possessed any coast along the Baltic ; and the Dwina is navigable for several hundred miles. But, of course, it is ice-bound for more than half the year, and exports at present only the products of the frozen north.

N.B.—Its connection by rail with Ishim *via* Perm and Tyumen will open up to it the Siberian trade.

3. On the Baltic there are five important harbours—St. Petersburg, Riga, Libau, Reval, and Helsingfors.

1. St. Petersburg has a population of over 1,500,000, *i.e.* as large as Glasgow and Liverpool combined. It is a river harbour, but is connected by a ship-canal with its seaport Kronstadt. It exports the productions of the Lakes district, the minerals of Moscow, and the grain and fibres of Great Russia ; but it is much hampered by ice.
2. Riga, which is as large as Bradford, is also a river harbour, with an outport, Dünamunde. It is the outlet for the forest and grain district of West Russia. It is rather more free

from ice than St. Petersburg is, but navigation is generally stopped for four months every year.

3. Libau and Revel are much smaller ports, which export timber and import cotton. Revel, the larger town of the two, is about the size of Ipswich; and Helsingfors, the capital of Finland, is about the size of Swansea.

N.B.—Windau is the port most free from ice.

4. The Black Sea also has five important harbours—Odessa, Batum, Nikolaiev, Kherson, and Sebastopol.

1. Odessa is a city the size of Leeds, and rivals St. Petersburg as a port. It commands nearly all the Russian trade through the Suez Canal, and exports enormous quantities of grain.
2. Batum, Nikolaiev, and Kherson are also grain ports; but, in addition to the grain trade, Batum has a large oil trade, and Nikolaiev is the chief naval station on the Black Sea, and Kherson has a large timber trade. Nikolaiev, the largest of the three, is about the size of Southampton.
3. The famous Crimean port of Sebastopol, which is a little town of the size of Dover, was an important commercial harbour; but it has been reserved lately as a naval station.
4. In the shallow Azov arm of the Black Sea, there are the important river harbours of Rostov and Taganrog. They export a large amount of grain and coal from the basin of the Don, which is the only river in Russia which is not blocked by ice for at least two months every year. Cf. p. 58.

5. The chief Caspian ports are Astrakhan and Baku.

1. Astrakhan, which is about the size of Birkenhead or Norwich, commands the through trade with Persia and Central Asia, and the very important sturgeon trade of the Caspian and the Volga.
2. Baku, the great oil port, is rather larger than Astrakhan.

6. Russia's land boundaries offer no protection from either climate or enemies, and no obstacle to commerce or to Imperial expansion. Cf. p. 50.

Surface.

1. Russia contains half of the whole area of Europe ; and the greater part of this huge area is a series of low, very level plains—part of the Great European Plain—which slope down almost imperceptibly to the four seas.

1. The exceptions are :—The group of little hills known as the Valdai, which form the main watershed of Russia, although they are no higher than the Cotswolds ; all the large section of the Ural Mountains which runs through the middle of East Russia ; and the Caucasus Mountains, which are well within the political boundary of Russia, but which really form the main physical boundary between Europe and Asia.

2. As Russia extends over more than 30 degrees of latitude, the climate ought to vary very much ; but the distance from the Atlantic and the character of the country minimise the variation.

1. As there are no mountains in the north, and as the Urals offer practically no obstacle on the east, the whole country is exposed to the icy Arctic and Siberian winds in winter.
2. As the country is too far from the Atlantic to get much rain, or to feel the moderating influences of the open ocean and the Gulf Stream, the climate almost everywhere is very dry and has great extremes.
3. Such moisture as is brought by south-west winds off the Mediterranean and the Black Sea, is generally intercepted by the Caucasus range, of which the Yaila Mountains in the Crimea are really a part.

N.B.—The greatest drought and the greatest extremes are in the same place—in the lowlands north-west of the Caspian ; and the dryness, as in Canada, makes the cold much more bearable.

3. Consequently, the river system has peculiar advantages and disadvantages.

1. Climatically, the scanty rainfall causes the volume to greatly decrease in summer, though the amount of forest helps to store and economise the rainfall ; and the want of protection from the north and the east causes nearly all of them to be ice-bound for at least three months every year.

2. Physically, the lowness of their banks causes them to flood easily when the snow melts ; many of them are impeded by rapids—*e.g.* the Dnieper and the Neva—or by shallows—*e.g.* the Don ; all of them empty into inland seas ; most of them flow through thinly-populated districts, some even flowing over the barren Tundras ; and the longest of them, the Volga, empties into a landlocked lake, which is slowly drying up. Cf. p. 53.
3. On the other hand, the very gradual slope makes their current very slow, and enables the whole country to be covered with a network of canals ; the enormous size of the country makes their courses generally very long, and their basins very large ; and they flow in all directions from the common centre of the Valdai Hills. Cf. p. 58.

Vegetation and Minerals.

1. The surface is divided naturally into five belts of vegetation from north to south—the Tundras, the Forest, the Agricultural, the Pastoral, and the Fruit Belts.

1. The Tundras are bleak, moss-covered plains stretching east and west of the White Sea—the home of the reindeer.
2. The Forests cover the whole country south of the Tundras down as far as a line drawn from Warsaw to Perm. They are composed partly of pine and fir, and partly of deciduous trees, such as oak, beech, and birch ; in the clearings of the pine and fir region the soil and climate are most suited to rye and oats ; in the clearings of the deciduous trees, especially in the basins of the Düna, Kiasma, and Kama, the fibre mould of the fallen leaves is peculiarly suited to flax and hemp.

N.B.—The pine forests form the great fur region ; the oak and beech forests shelter huge herds of swine ; and the birch forests supply the bark which gives 'Russia' leather its pleasant scent.

3. The Agricultural Belt, which stretches from the Pruth to the Volga, owes its importance to its rich 'Black Earth.' When uncultivated, this soil is covered with the flowers which make Little Russia so famous for honey ; when cultivated, even in the most primitive way, it produces enormous quantities of wheat on the drier parts and of maize on the damper.

4. The Pastoral Belt is practically the Steppes. Much of it is very salt, being part of the old bed of the Caspian (cf. p. 53), and most of it is a waste of snow in winter and a waste of sand in summer ; but in spring and autumn it can support an immense number of horses and cattle.
5. The Fruit Belt extends across the extreme south of the country, throughout which there is a total area half as large as England under the vine, mainly in Bessarabia, the Crimea, and Trans-Caucasia. In the latter district also, under the shelter of the huge Caucasus range, all sorts of sub-tropical fruits will ripen in the open air, and even cotton is grown. Cf. p. 55.

2. Russia has very great mineral wealth, especially in coal and iron and in the precious metals, but it is at present scarcely developed at all.

3. The coal area is larger than that of any other European country, and is well distributed.

1. The largest field is in the basin of the Donetz, near Kharkov, and this has made the city one of the great seats of general manufacture, and given it a population as large as that of Cardiff.
2. The second field is in the basin of the Vistula, near Lodz ; and the nearness to the Silesian sheep-pastures, and the facilities for importing cotton and flax up the Vistula to Warsaw, have made Lodz the most important textile centre in Russia, and drawn to it a population twice as large as that of Bolton or Dundee.
3. The third field is in the very heart of the country, round Tula ; it has made Moscow the great railway centre of the country, with a population nearly twice as large as that of Birmingham, and has also drawn to it a large trade in raw cotton and silk *via* the Caspian Sea.
4. There is also a small field in the basin of the Kama, near Perm, which has been of very great value in developing the mineral wealth of the Urals.
5. On the Caucasian coast of the Caspian Sea there are also extremely rich oil wells. The quality is inferior to that of the American oil, but it is beginning to be very widely used for locomotives and steamers, and it has drawn to Baku a population as large as that of Portsmouth.

4. The iron, fortunately, is generally found with the coal, and near limestone.

1. It is naturally most valuable round Tula and Lodz ; but it is being worked very largely in connection with the Donetz coal—*e.g.* at Ekaterinoslav—and in connection with the oil trade up the Kama (*i.e.* the Volga)—*e.g.* at Slatoust.

5. The Urals are very rich in gold, platinum, copper, and precious stones ; Ekaterinburg is the centre of all the mining, and Perm is the depot of all the mineral wealth on the European side of the Urals, being connected with Ekaterinburg by rail.

1. Perm has also a rock-salt trade ; but most of the salt in the country comes from the great salt marshes north of Astrakhan.

Towns.

1. Russia has eighteen cities with a population of over 100,000, and four of them have over 400,000—St. Petersburg, Moscow, Warsaw, and Odessa.*

1. St. Petersburg is the great centre of foreign trade and commerce, while Moscow is the great centre of domestic trade and commerce. Cf. pp. 81 and 85.

2. Warsaw, with a population nearly equal that of Liverpool, stands on the fertile Polish coal-and-iron field at the head of steam navigation on the Vistula.

2. Lodz, Riga, and Kiev have populations varying from about 350,000 down to 285,000 (= Belfast and Bradford).

1. Kiev owes its importance to its facilities for transport—especially of grain and wood—along the Dnieper, and it is near enough to the Kharkov coal-field to have very large beet-sugar and leather industries.

3. Kharkov and Baku have nearly 200,000 ; and Tiflis, Vilna, Saratov, and Kazan vary between 160,000 and 145,000.

* For details of ports and mineral centres, see pp. 81, 82, 85.

1. Tiflis owes its importance to transport, for it commands all the local trade along the valley of the Kur, all the through trade from the Black Sea to the Caspian, and the great Darial Pass which crosses the Caucasus from north to south. Cf. p. 55.
2. Vilna is a great railway junction and frontier fortress and the centre of the grain and timber trade of West Russia ; and Saratov is a river and rail junction in a rich tobacco-growing country.
3. Kazan, on the great westward bend of the Volga, commands the home trade between the manufacturing industries of Moscow and the mining industries of Perm, and the Siberian trade to Nijni-Novgorod.
4. Ekaterinoslav, Kishinev, Astrakhan, Rostov, and Tula have from 135,000 down to 110,000.
 1. Besides its iron, Ekaterinoslav commands an important bridge across the bend of the Dnieper above the rapids.
 2. Kishinev is the capital of the wine and tobacco province of Bessarabia.
5. Four other towns—Nijni-Novgorod, Nicolaiev, Samara, and Minsk—have nearly 100,000.
 1. Nijni-Novgorod is a very old town, with a famous fair ; Samara occupies a curious position on the Volga, commanding both the railway and the river traffic from Moscow to the frontier caravan mart of Orenburg ; Minsk stands where northern traffic must converge to get round the Pripet marsh.

N.B.—When Russia begins to work her coal (contrast p. 62 with p. 85), a large number of other towns will suddenly rise into importance.

GERMANY.

Surroundings.

1. THE sea-coast of Germany extends for about 1200 miles, *i.e.* one-third of the whole frontier, interrupted only by the little isthmus of Schleswig. Cf. p. 79.

1. There are numerous inlets, but few good harbours, for the shore water is so shallow that vessels cannot usually approach the land, except where river currents have worn a channel.
2. The North Sea coast, as in Holland, has to be protected by dykes wherever the sand-dunes are not able to prevent the sea from breaking in. The Baltic coast is higher, but is greatly marred by a series of very shallow lagoons called Haffs.
3. Owing to the absence of protection on the north and the east, the Baltic ports are very much hampered by ice in winter, and even the North Sea Ports are not quite free from it.

2. The three most important harbours are Hamburg, Stettin, and Bremen.

1. All three have outports — Cuxhaven, Swinemünde, and Bremerhaven; and of these only Cuxhaven and Bremerhaven have more than 25 feet of water, and are always free from ice. Cf. Emden.
2. Hamburg is as large as Glasgow—and Altona is as large as Dundee. Its approach from the North Sea is always open, and is guarded by Heligoland; it is connected with the Baltic by a ship-canal, and has excellent communication inland by rail, river, and canal, the Elbe being navigable up to Prague. Consequently, it does more trade than all the other German ports combined. It is the fourth port in the world—after London, New York, and Liverpool.
3. Stettin, the size of Leicester, is the nearest port to Berlin, and has good inland communication, the Oder being navigable up to the Austrian frontier.
4. Bremen (=Dundee) has good inland communication up the Weser, and its approach is guarded by Wilhelms-haven, the only German naval station which is not frozen in winter. Being the nearest port to the Atlantic, it has been made the headquarters of the North German Lloyd steamers, and this has drawn to it a very large emigration traffic.

3. Of the minor ports, Königsberg, Danzig, Kiel, and Lübeck are the chief.

1. Danzig, which is the same size as Croydon, exports the wheat of West Russia and Poland down the Vistula; and Königsberg, which is the size of Cardiff, exports the fibres and timber of East Prussia and of the Vilna district of Russia, —largely through its outport of Pillau.

2. Lübeck is losing, and Kiel is gaining, in importance—chiefly owing to the 'North Sea and Baltic Canal,' which saves the long and dangerous route round the Skaw.
4. The land boundaries in the northern half are good for commerce and bad for defence, and in the southern half are bad for commerce and good for defence, and in both halves are bad for climate.
 1. The absence of mountains on the north and east lets in the dry Arctic and Siberian winds in winter; and their presence on the south and west keeps out the moist Anti-Trades.
 2. In the extreme west and the extreme east the country is terribly exposed to invasion, but this is compensated for by the facilities for trade.
 3. In the south the only points of political danger or of commercial advantage are the 'joints' between the various mountain ranges, *e.g.* the Doubs valley between the Vosges Mountains and the Alps, the Danube valley between the Alps and the Bohemian Forest, and the Elbe valley between the Erz-gebirge and the Riesen-gebirge. Cf. p. 65.

Surface.

1. The surface shows a similar distinction, the northern half being low and level, and the southern half being high and hilly.
 1. The northern half is part of the Great European Plain; but in the centre and the east it is usually much more sandy and much less fertile than other parts of the Plain. The southern half contains the plateau of Bavaria and the basin of the Middle Rhine; and, as the latter runs between the Vosges and the Black Forest, it is exceptionally well sheltered.
 2. The best dividing line is the valley of the Main from its source on the Fichtel-gebirge to its confluence with the Rhine. Between the middle course of the Weser and the Saale, the Harz Mountains rise to the height of Snowdon; but the Fichtel-gebirge is the centre from which the general mountain system radiates—the Franconian and Swabian Jura to the south-west, the Thuringian Forest to the north-west, the Bohemian Forest to the south-east, and the Erz-gebirge to the north-east.

2. The climate varies with the surface, but it is dry everywhere except amongst the Baltic marshes, and therefore is subject to extremes.

1. The height of the southern half counteracts the warmth of the latitude.
2. The Harz Mountains, which are far enough north to catch the wet winds coming across the plain of the Netherlands, have the heaviest rainfall.
3. The Rhine valley is well enough sheltered to enjoy the full advantage of the warm latitude, and has rich alluvial soil.
4. Extremes of temperature increase towards the east, *i.e.* with increase of distance from the Atlantic.
5. The whole country slopes generally northward, *i.e.* away from the sun.

3. In Germany, as France, therefore, almost all the rivers empty towards the north-west, *i.e.* towards the open ocean; and this causes most of her goods to seek markets in the same direction as British goods do.

1. As in France, too, the watersheds are far enough from the sea for the rivers to be of considerable length. Indeed, the largest rivers either do not rise in Germany or do not empty through Germany; *e.g.* the Elbe, Oder, Vistula, Danube, and Rhine.

N.B.—Even the Weser, which is entirely a German river, is nearly twice as long as the Severn; and the navigable part alone of the Main is considerably longer than the whole of the Severn.

2. The flatness of the country, or the lowness of the watershed, causes the current to be generally very slow, and therefore very favourable to navigation. For instance, the Danube is navigable to Ulm, the Rhine to Schaffhausen, the Ems to Münster, the Weser to near Cassel, the Elbe to Prague, the Oder to Ratibor, the Vistula to considerably beyond Warsaw, and the Niemen to Grodno; and none of these, except the Rhine and the Vistula, flow from mountains that are much higher than Ben Nevis.

4. By far the most important rivers are those which empty into the North Sea, especially the Elbe and the Rhine.

1. The Rhine binds together southern and northern Germany ; and, in addition to its immense value as a glacier-fed highway of commerce, it has also a very fertile basin and a very beautiful course, the German portion of which may be divided into four sections, three of them making up the 'Middle Rhine' (Bâle to Bonn). River-steamers can navigate the whole distance up to Bâle, and as far as Bamberg on the Main ; and small ocean-steamers can reach Mannheim and Frankfurt.

From Bâle—which is thus the head of navigation—to Mannheim it flows between the Vosges and the Black Forest. Bâle commands the head, and Strassburg the centre of this valley plain. Bâle distributes trade to France, Germany, and Switzerland ; the Rhine and the Rhone are connected by a canal through Mülhausen ; and Strassburg guards the Vosges passes.

From Mannheim—which is thus the head of the ocean traffic—to Mainz it flows over a broad alluvial plain ; and the junction with the Neckar, besides bringing timber from the Black Forest, makes Mannheim the head of navigation even for most of the river-steamers.

Between Bingen and Bonn it cuts through a slate plateau, which ends in the Drachenfels. This portion is famous for its ruined castles, its vineyards on the sunny slopes of Mount Taunus, and 'the Confluence' (Coblentz) with the Moselle.

From Bonn northwards it is called the Lower Rhine, and flows through the extremely rich mining district of Rhenish Prussia, which contains cities like Cologne—practically an ocean port—Düsseldorf, Elberfeld, Barmen and Krefeld.

2. The Elbe is three times as long as the Severn, and has good navigation right up to Prague *via* the Moldau. It flows in its middle course through the sheep-pastures, the coal and silver mines, the salt-fields, and the beetroot farms or Saxony—one of the most densely-peopled parts of Europe ; it is the great highway of commerce between the chief port, Hamburg, and the capital, Berlin, *via* the canals of the Havel and Spree rivers ; and its course through 'the Saxon Switzerland' is very beautiful.
3. The chief Baltic rivers are the Vistula and the Oder. The Vistula is really a Russian river, and exports the timber, grain, and fibres which give Danzig its chief trade ; the Oder flows through the great mining and manufacturing district round Breslau, and through the agricultural district

round Frankfurt, and then becomes the highway of commerce between Berlin and Stettin.

N.B.—Originally the Vistula emptied through the 'Oder,' and the Oder through the 'Elbe,' and the Elbe through the 'Aller,'; but a great earth-movement—along the line of Bronburg, Magdeburg, Minden—diverted them.

4. The Danube is chiefly valuable because it is connected by canal with the Main and Rhine, which gives it a through trade. It is navigable by steamer from Passau up to Ratisbon, and for boats up to Ulm, and is the link between the pencil-wood of the Franconian or Black Forest and the 'lead' of Passau.

N.B.—Pencil-cedar is imported.

Vegetation and Minerals.

1. The vegetation, of course, varies with the soil and the climate; and the best soil is found, along with the most favourable climate, in the Rhine basin.

2. The central coast-lands and the hilly districts, wherever there is sufficient rain, are covered with timber, especially beech, pine, fir, spruce, and birch.

1. The toy factories of Nürnberg draw wood from the mountain ranges known as the *Black Forest*, the *Bohemian Forest*, and the *Thuringian Forest*; large quantities of timber are floated down the rivers, especially the Vistula and the Neckar; and the beech and oak forests contain huge herds of swine, the famous Westphalian hams coming from the grain-lands below the Teutoburger Forest.

N.B.—It is off the mouth of the Vistula that the valuable supplies of amber are found.

3. Pasture is found almost everywhere—for sheep on the drier hills in the east, and for horses and cattle on the damper plains of the west and north.

1. Saxon and Silesian wools are very valuable, and supply some of the factories of Görlitz, Breslau, and Liegnitz; the horses and cattle come from Northern Germany, the cattle especially from Hanover and Schleswig-Holstein.

4. The north, however, being the flattest part of the country, is largely devoted to grain wherever the soil is sufficiently fertile, and to roots wherever it is sufficiently light.

1. Rye, which does not need either good soil or good climate is by far the most important grain ; potatoes are even more important—as food for the peasants—than the black rye-bread is, and are grown in enormous quantities all over the northern plain, especially on the low sandy soil of Pomerania and West Prussia ; and beetroot is grown towards the other end of the plain, especially in Hanover and Brunswick, which supply the sugar factories and distilleries of Magdeburg and Brunswick.

N.B.—Flax and hemp are grown in Westphalia, Saxony, and Bavaria.

5. The sheltered valleys of the south-west, with their rich alluvial soil and lower latitude, can grow plants such as the vine, hops, and tobacco.

1. The vine flourishes best on the dry, sunny slopes of the Vosges Mountains, though of course, only light wines can be produced ; and the hops grow very well in the Bavarian valleys, where they supply the breweries of Munich.

6. Germany is very rich in coal and iron, and produces also salt, zinc, silver, and copper.

1. The coal and iron are generally found together, and near navigable water, in the basins of the Rhine, the Elbe, and the Oder. This increases the value of both, and attracts manufactures.

7. In the Rhine basin the coal lies along the three tributaries, the Ruhr, the Saar, and the Ill ; and along the Ruhr and the Saar there is also excellent iron.

1. In the Ruhr district the chief centre is Düsseldorf, but the collieries are round Dortmund ; Essen, Iserlohn, and Hagen manufacture iron and steel ; Elberfeld and Barmen manufacture cotton and wool ; and Krefeld and Cologne manufacture silk. Gladbach also manufactures cotton ; Aachen, wool ; and Bielefeld, linen.
2. In the Saar district the fuel and machinery are very useful to the great fortress of Metz, and to commercial centres like Saarbrück.

3. In the Ill district they are very useful to the great fortress of Strassburg, and to the cotton factories of Mülhausen and Kolmar. The latter also profit by the water-power.
8. In the Elbe basin the coal-fields are in both the province and the kingdom of Saxony ; and in the Oder basin they are in Silesia.
 1. In the Province of Saxony the coal is of the lignite kind, but it is valuable to the sugar-refineries and distilleries of Magdeburg, and to the salt-works of Schönebeck, Stassfurt, and Halle.
 2. In the Kingdom of Saxony, the chief coal centre is Zwickau, while Chemnitz is very famous for cottons and machinery, Leipzig for woollens and printing, and Dresden and Meissen for porcelain. Cf. p. 63.
 3. In the Oder basin the only very large centre is Breslau, but Görlitz is developing a considerable trade in cotton and wool.
9. The chief silver mines are on the Saxony coal-field at Freiberg ; the salt is on the neighbouring lignite-field round Halle ; the zinc on the Oder coal-field at Königshütte and on the Rhine coal-field at Aachen ; and the copper is found in the Erz and Harz Mountains. Tin is also being worked in the Erz.

Towns.

1. Germany has more than thirty towns with a population of over 100,000.
 1. Of these, Hamburg, Königsberg, Altona, Bremen, Stettin, and Danzig, are harbours. Cf. p. 88.
 2. Berlin stands on a sluggish stream in the middle of a sandy plain, but it has a population three times as large as that of Manchester, *i.e.* one-fourth the size of London. This means that politics and commerce have conquered its natural disadvantages.
 1. It is the capital of the Duchy of Brandenburg, the Kingdom of Prussia, and the German Empire ; the plain is very low, giving every facility for communication in every direction ;

and the city is in the very middle of the country, commanding the routes from Hamburg to Breslau, from Stettin to Halle, from Cologne to Danzig, etc.

3. Munich, Leipzig, and Breslau have populations of between 500,000 and 420,000 (=half Hamburg).

1. Munich has both political and commercial importance ; it is the capital of the kingdom of Bavaria, and a railway centre commanding the traffic of North Germany with the Adriatic —up the Inn valley and over the Brenner Pass.
2. Leipzig was the centre of the old road system of Northern Germany, which has in modern times become a railway system in connection with the Saxony coal-fields. Its position made it, like Dublin, a university, and this drew to it a very large book and printing trade. In connection with book-binding, it became a great leather market ; and it is also the greatest fur market in the world.
3. Breslau has the advantages of a navigable river and a rich coal and iron field, and is a frontier market between Eastern and Central Europe.

4. Dresden and Cologne are about the same size as Dublin or Bristol.

1. Dresden has both political and commercial advantages ; it is the capital of the kingdom of Saxony, and stands on a navigable river in the middle of a coal-field, just where it commands the passes through the Erz-gebirge into Bohemia.
2. Cologne, like Breslau, has the advantage of a navigable river, and a very rich coal and iron field ; and the latter, and its position between France and Germany, have made it a great railway centre.

5. Frankfurt (on Main), Nürnberg, Magdeburg, and Hanover have populations of from 290,000 to 230,000.

1. Frankfurt stands on a navigable river, the valley of which is the natural route from the Danube (at Ratisbon) to the great coal-field of Rhenish Prussia ; and the sunny slopes of the hills, which shelter it from the north and north-east, are very favourable to the vine. Its position between the two rivers, and between North and South Germany, made it the old capital of the German Confederation, and makes it now a most important railway centre.
2. Magdeburg stands in the middle of a coal-field on a navigable river, just where the hardness of the rock makes it easy to

bridge the river. There is a great deal of salt in the neighbourhood, and the salt and climate suit sugar-beet.

3. Nürnberg commands the southern part of the Main valley, as Frankfurt does the northern; and it utilises the surrounding forests and the graphite of Passau in its famous toy and pencil factories.

N.B.—It is too far from water-transport to make *heavy* goods.

4. Hanover, the old capital of the kingdom of Hanover, is on the direct line from Rotterdam to Berlin, in a plain where the soil and climate are very favourable to roots, especially beet and potatoes, both of which are used in distilling spirits.

6. Düsseldorf, Stettin, Chemnitz, Essen, Charlottenburg, and Stuttgart, like Königsberg, have just over or just under 200,000 inhabitants apiece.

1. Düsseldorf is on a navigable river in the centre of a very rich coal and iron field.
2. Chemnitz stands among the sheep pastures of Saxony, where it can use the rich coal and iron field in manufacturing cottons and woollens, the cotton being imported up the Elbe.
3. Stuttgart, the capital of the kingdom of Wurtemberg, uses the Black Forest for similar purposes; and there is charming scenery in the Neckar valley.
4. Charlottenburg is simply the 'West-End' suburb of Berlin.

7. Elberfeld, Strassburg, and Halle—like Altona and Bremen—are about the same size as Aberdeen or Dundee. Cf. p. 88.

1. Strassburg is a very important military and commercial centre between the Zorn valley, *i.e.* the route from Paris across the Vosges, and the Kinzig valley, *i.e.* the route from the Danube across the Black Forest.

8. Dortmund, Barmen, Mannheim, Aachen, and Brunswick are, like Dantzig, about the size of Oldham or Norwich.

1. Aachen, a frontier town amongst the sheep-pastures of the Ardennes, has woollen manufactures; it is also famous for warm springs (Aix=Latin *agua*), cf. Wiesbaden.

9. Posen has nearly 120,000 ; and Kiel, Krefeld, and Kassel have nearly 110,000.

1. The water at Krefeld is peculiarly well suited to silk-dyeing. Cf. pp. 4 and 71.

AUSTRIA-HUNGARY.

Surroundings and Surface.

1. THE very little sea-coast which Austria-Hungary does possess, is on an inland sea inside another inland sea.

1. The coast is much broken and fringed by innumerable islands, but it has only three useful openings—the gulf of Trieste, Quarnero, and Cattaro.
2. Trieste, which is about as large as Cardiff, has to compete with Venice on the one side and Fiume on the other ; but it has good communication inland, especially through the Semmering Pass, and has been much benefited by the Suez Canal.
3. The Gulf of Quarnero is a less good harbour, mainly owing to the Bora winds ; but Hungarian jealousy of Austria has made Fiume into a port—about as large as Perth or Dover.

N.B.—Cattaro is the best harbour of the three, but is too much out of the way. Cf. Milford Haven.

2. The land surroundings are rather curious, for the mass of the country is surrounded by mountains everywhere except where the Danube enters and leaves it. Cf. p. 5.

1. Unfortunately, there are the detached provinces of Galicia and Bukowina in the north-east, and Bosnia and Dalmatia in the south-west ; and this, added to the jealousy between Austria and Hungary, makes the country very difficult to govern.

2. The difficulty is increased by the mixture of peoples—Germans in the north-west, Slavs in the north-east, Magyars in the south-east, Italians in the south-west.

N.B.—Note the importance of the “Moravian Gate” between the Sudetes and the Carpathians, and of the Semmering Pass between the Dinaric Mts. and the Alps.

3. The chief surface feature is the enormous plain of the Middle Danube—*i.e.* Hungary—which slopes up to the surrounding mountains. Cf. p. 59.

1. In the north-west there is the plateau of Bohemia, and in the south-east the plateau of Transylvania.
2. In the south-west the whole Alpine district is very hilly, while in the north-east Galicia forms part of the Great European Plain.
3. The high Austrian part is separated from the low Hungarian part by the Leitha river.

4. The large extent and the variety of this surface cause considerable variety of climate; but everywhere, except on the coast, the climate is one of extremes—being so dry that even large lakes, *e.g.* Lake Balaton, are gradually evaporating. Cf. p. 53.

1. The mountains are not high enough to completely keep out either the cold winds from Russia or the hot winds from Africa; and the distance from the sea prevents any part except the Alps from having a large rainfall.
2. The low Hungarian plain is exposed to drought, and the high Austrian plateaux have very cold winters.
3. The north side of the mountains everywhere, even in the most southerly latitude, gets very little sunshine, and *vice versa*.

5. The soil is generally fertile, especially in the plains, and on the volcanic slopes of Bohemia.

1. In the Banat, Galicia, and the river basins of the south-west, the soil is very rich.
2. The Pusztas of Northern Hungary are rather barren, and there are marshes along the Hungarian rivers.
3. The destruction of the timber in the south-west has so exposed the soil to the action of rain, hot sun, and the icy

Bora, that the Karst district has become practically a desert. Cf. p. 79.

N.B.—Traces of the volcanic action in the Bohemer Wald and Erz-Gebirge are still seen in the warm springs, *e.g.* of Karlsbad and Marienbad.

6. The Danube is the key to the whole country, though there are other useful rivers—the Elbe, Dniester, Vistula, and Adige, all of which, however, empty through foreign countries.

1. The three great tributaries of the Danube are all navigable—the Theiss to Tokay, the Drave to its confluence with the Mur, the Save to its confluence with the Kulpa.

Vegetation and Minerals.

1. The vegetable wealth of Austria-Hungary is very great—pasture, forests, and agriculture being all very important.

2. Cattle, sheep, and pigs practically monopolise attention; but goats and silkworms are kept in the south-west.

1. The cattle are most numerous on the lowlands, especially round Maria-Theresiopol, Kecskemet, and Debreczin.
2. The sheep are most numerous on the dry hills of Bohemia and Silesia, where they supply wool to the factories of Brünn and Troppau.
3. The pigs are most numerous among the oak and beech forests of the south, especially in the maize district of the Save basin. Cf. p. 181.
4. The goats are mainly among the Alpine heights, and the silkworms in the sheltered Adige valley, where the mulberry can get sufficient warmth and moisture.

8. Agriculture supports directly two-thirds of the population; but, owing to soil and climate, it is much more important in Hungary than in Austria. It includes grain, roots, fibres, hops, and fruits.

1. A large number of people eat rye-bread; but barley is grown on the Bohemian plateau, and immense quantities of

wheat and maize are grown on the low plain of Hungary, where the dry climate and the good machinery are very favourable to flour-milling.

N.B.—The dry climate, the presence of limestone, and the amount of grain encourage poultry farming. Two *billions* of eggs are exported annually. Cf. p. 115.

2. Potatoes are grown everywhere, and beetroot (for sugar) is grown on the Bohemian and Moravian coal-fields. The hops are also grown on the coal-field. Cf. p. 102.
3. Flax, hemp, and tobacco are very important—the flax and hemp along the Russian border (cf. p. 84), where they supply the Moravian and Silesian factories, and the tobacco in the warm moist valleys of the south and along the Theiss, especially round Szegedin.
4. The vine flourishes on the sunny slopes of the Carpathians, especially round Erlau and Tokay, and of the Fruska-gora, especially round Karlovitz; Bosnia is very famous for plums; Dalmatia grows magnificent cherries, which are used in the manufacture of 'maraschino' at Zara; and the warmest parts of the south-west produce almonds, figs, olives, etc.

4. The country is very rich in timber, immense quantities being floated down the Danube.

1. Nearly one-third of the whole country is under timber, and in Bosnia, Herzegovina, and Bukowina (Beech-land), the proportion is much greater.
2. The wood of the north-west is made into cheap furniture at Vienna; that of the south-west is exported, from either Trieste or Fiume, to Sicily for orange boxes or to France for wine casks.
3. The potash of the Bohemian Forest, and the mineral wealth of the Eger basin, have made Bohemia very famous for ornamental glass.

5. The country is well provided with minerals, especially coal and iron, salt, silver, gold, opals, mercury, lead, and oil.

1. Salt is found in Galicia, Transylvania, and Salzburg (= Salt-town). The mines of Galicia, especially those of Wieliczka, are the most famous in the world; the bed is 300 miles long, 4000 feet deep, and has been worked for 600 years.

N.B.—The oil also comes from Galicia, especially from round Lemberg.

2. The silver, one of the 'colouring' metals which, with the silica and potash, have made Bohemia famous for glass, comes mainly from the Eger valley, especially round Joachimsthal.
3. Amongst the other minerals of Bohemia are such 'colouring' metals as copper and cobalt, and kaolin and graphite. The kaolin accounts for the porcelain of Karlsbad, and the graphite for the pencils of Budweis.
4. The gold is found only in Hungary, mainly round Kremnitz and Schemnitz, and in Transylvania, mainly round Kronstadt; and the opals are most abundant near Vorosvagas.
5. The mercury, which is very valuable to the gold industry, comes from Idria. the lead mines of Bleiburg are very rich.
6. The coal and the iron are largely confined to Austria, and are found both in the north-west and in the south-west; but, unfortunately, they are found at some distance from each other.
 1. The best coal, and the largest amount, are in Bohemia, Moravia, and Silesia, the centre being Pilsen; but the fields along the Erz-gebirge, where the iron is mainly found, are lignite.
 2. Abundance of excellent iron is found in Styria and Carinthia, especially round Grätz; but the coal again is lignite.
 3. Consequently, while the great hardware centres are Steyr, Grätz, and Klagenfurt, the textile manufactures are practically confined to the northern coal-field—the centres being Reichenberg, Trautenau, and Pilsen in Bohemia; Brünn and Inglau in Moravia, and Troppau in Silesia.

N.B.—Cotton and silk are imported up the Elbe.

Towns.

1. There are only eight towns with a population of over 100,000, of which six are in Austria.
2. Vienna is nearly as large as Berlin, and is a city of very great importance, which it owes to several causes—political and commercial.

1. It is the capital of Austria, as well as of the Empire ; it lies between the northern and southern provinces of Austria, just at the point where the Danube leaves the Austrian highlands for the Hungarian lowlands ; and it, therefore, commands the eastward and westward traffic along the Danube, and the northward and southward traffic through the Semmering Pass and up the Moravian valley, *i.e.* from Trieste to Cracow.

N.B.—It gets a large amount of silk from Trieste.

3. Buda-Pesth is as large as Liverpool, and is a very important centre, partly German in origin and partly Hungarian, as its name implies.

1. It is the capital of the kingdom of Hungary, having displaced Pressburg ; it stands at the lowest place where the Danube can be conveniently bridged, the banks being of hard rock ; and it has railway communication in every direction over the huge plain of which it is the mathematical centre—*e.g.* through the Jablunka Pass to Troppau, up the Theiss valley to Lemberg, east to Klausenburg, south-east to Orsova, south to Semlin and Belgrade, and south-west to Agram and Fiume.

4. All the other towns except Prague have populations of less than 200,000.

1. Prague is nearly the size of Leicester. It is the political capital of Bohemia, of which it is the natural centre ; it has the advantage of the navigable Moldau-Elbe, and of the Bohemian coal and iron-field ; and it stands on the old road through the Eger gap from Coburg to Breslau.

N.B.—The hops and barley of the Beram valley, the silver and kaolin of the Eger valley, and the flax and wool of the Elbe valley, make it the central market for Pilsen, Karlsbad, Reichenberg, and Trautenau.

2. Lemberg comes next to Prague in size, and is about as large as Bolton or Dundee. It is the capital of Galicia, and commands the through trade from the Dneister valley to the Vistula valley, especially to Cracow and Warsaw, round the base of the Carpathians.

3. Grätz is the capital of the Alpine provinces, and is the centre of the great iron and steel trade of the Mur valley.

N.B.—*Eiseners*, the name of a town higher up the valley, means 'Iron-ore.'

4. Brünn, which has a population of just over 100,000, occupies a similar central position in Moravia. It is the political

capital ; it is on a coal-field ; and it has a large beer and cloth trade in connection with its hops and wool.

N.B.—Szegedin is the same size, and Cracow is nearly 100,000.

5. Czernowitz is an important frontier town in Bukowina—on which it is the capital—just where the railway from Galatz to Lemberg crosses the Pruth river.
6. Temesvar is a railway junction in the centre of the fertile Banat, and stands on the Bega Canal.
7. Serajevo is the capital of Bosnia, and has been connected—*via* Mostar—by rail with the Adriatic ports of Ragusa and Cattaro, which will greatly increase its importance.

SWITZERLAND.

Surroundings and Surface.

1. SWITZERLAND is the only country in Europe, except Servia, which has absolutely no sea-coast at all.

2. The mass of the country is surrounded by very formidable natural ramparts—the Alps and the Jura.

1. The three chief ranges of the Alps are the Pennine, the Lepontine, and the Rhaetian.
2. There are three very important passes—the Great St. Bernard, the Simplon, and the St. Gothard ; and three less important ones—the Splügen, the Maloggia, and the Arlberg.
3. These passes and the great lakes which form part of the boundary, give access to markets in all the surrounding countries in spite of the natural isolation of the country.

3. The *average* height of Switzerland is as great as that of Snowdon.

1. This high average, of course, is due to the fact that half the surface is occupied by the Alps ; but the plateau between the Alps and the Jura is not higher on the average than the Cotswolds.

2. The Bernese Alps, which separate the basins of the Rhone and the Aar, attain in Finster-Aar-Horn and Jungfrau a height about three times that of Ben Nevis ; but they are crossed by passes of about half that height, *e.g.* the Grimsel and Gemmi.

4. All the great valleys are occupied by the beds of important rivers, and the plateau is dotted with lakes.

1. Geneva and Constance are about twenty times as large as Windermere, or five times as large as Loch Lomond ; Lucerne is four times, and Neuchâtel nine times, as large as Windermere ; and Zurich is nearly as large as Lucerne.

N.B.—The Rigi and Pilatus overlook Lucerne.

5. The vegetation varies with the climate and soil ; but the height makes the general temperature low, and a quarter of the soil is useless.

1. The Alps are too high to admit the warm winds from the Mediterranean into the country ; but they cause a very heavy fall of rain and snow, and most of the snow is melted by the Föhn wind from the Sahara.
2. The deep sheltered valleys in the south are often very hot in summer ; while the northern plateau is much exposed to cold winds in winter.
3. The torrents carry down to the low levels an immense amount of alluvium, which is very fertile ; but elsewhere the soil is poor.

6. Under such circumstances, the higher and more exposed parts are devoted to forests and pasture, while the lower and more sheltered parts are devoted to agriculture.

1. The timber is grown mainly in the basins of the Rhine and the Rhone.
2. Large numbers of cattle, goats, and sheep are fed on the Alpine pastures up to a height twice as great as that of Snowdon ; but, of course, they have to be taken down to the valleys in winter. Very large quantities of condensed milk and cheese are exported, the latter mainly from Gruyère *via* Lake Geneva.

3. The agricultural products are few, but grapes are grown successfully along the sunny slopes of the Jura, and fibres are grown in nearly every part of the country—flax and hemp on the low tableland of the north, and tobacco in the warm valleys of the south.

Towns and Industries.

1. There is practically no mineral wealth, and the want of coal ought to be very serious ; but the water-power is so universal, so constant, and so strong, that manufactures are very important.

1. The poverty of the soil has aided in this result, which has been further assisted by the excellent education of the people.
2. The manufactures are often such as need much skilled labour, but little raw material, *e.g.* watches, wood-carving, embroidery. Cf. Birmingham, p. 41.
3. The railways have, of course, immensely increased the ease of importing raw materials, *e.g.* cotton and silk.

2. Only three towns—Zurich (175,000), Bâle (125,000), and Geneva (113,000)—have populations of at least 100,000 ; but, owing to the conditions under which the people live, and to the fact that Switzerland is ‘the summer playground of Europe,’ many of the towns are famous or important in spite of their small population.

1. Zurich owes its importance mainly to its commerce as a railway centre—for Geneva, Constance, Schaffhausen, the St. Gothard Tunnel, Bâle, and the Arlberg Tunnel. It manufactures silks, like Bâle, and cottons, like St. Gall and Glarus, and is the capital of German Switzerland.
2. Geneva is the capital of French Switzerland ; it commands the large trade with France, is in a very beautiful district, and has abundant water-power. Its chief industry is watch and clock making.
3. Bâle commands the trade with the Rhine valley, is on navigable water, and specialises in silks ; and the central position of Bern (70,000) is very suitable for a political capital.

4. Lausanne, like Interlaken, is mainly a fashionable resort ; Chaux-de-Fonds, Le Locles, and Neuchâtel are occupied in the clock and watch industry ; and St. Gall, like its neighbours Apenzell and Glarus, is occupied in the cotton industry.
5. Volcanic action has left its traces in warm springs, *e.g.* at St. Moritz and Ragatz.

N.B.—A large proportion of the people are scattered over the country, as the abundance of water-power enables many industries to be carried on in or near the cottages of the workers.

IBERIAN PENINSULA.

Surroundings and Surface.

1. **THOUGH** the Iberian Peninsula is entirely surrounded by sea except where the formidable double range of the Pyrenees cuts it off from France, its coast is not very useful, having five great defects.

1. It has dangerous currents, such as helped to wreck *H.M.S. Serpent*, the *Roumania*, the *Trinacria*, the *Utopia*, and many other vessels ; and on the Atlantic side there are also very strong tides.
2. On the north and north-west it is very rugged, and yet very badly supplied with lighthouses—some of them being practically behind hills, ‘to shelter them from the violence of the Atlantic’!
3. It is very badly supplied with harbours, partly because the currents close the openings on the north and north-west, and partly because elsewhere there are scarcely any openings at all to make into harbours.
4. The enormous masses of magnetic iron in the Galician Mountains are said to affect the compasses of passing ships.
5. Very few of the harbours have good communication inland.
2. There are two really good harbours, Lisbon and Barcelona.

1. Lisbon, which is about the size of Edinburgh, is on the magnificent estuary of the Tagus, and is protected from the Atlantic by Cape da Roca. It has good communication by rail and river up the Tagus valley; it has great advantages for an Atlantic trade of its own, especially with the Portuguese islands, *e.g.* Madeira and the Azores; and it is an important calling place between Southampton and Cape Town.
2. Barcelona, which is about the size of Birmingham, has an excellent harbour on the tideless Mediterranean; but it is strategically cut off from Lisbon by the enormously important British possession of Gibraltar.
3. There are, however, useful smaller ports on each coast.

1. The most important of them on the west coast is Oporto, which is as large as Aberdeen. The Douro is navigable for small vessels, but has a dangerous bar; the town owes its importance to the port-wine trade.
2. The Guadalquivir is dredged to admit small vessels to Seville; Cadiz is a fine roadstead; and Huelva ships copper.
3. On the north there are the coal and iron ports of San Sebastian, Bilbao, Santander, and Gijon, and the naval station of Ferrol.
4. On the Mediterranean there are also the wine and fruit ports of Valencia, Malaga, and Alicante, and the naval station of Cartagena; and the Balearic port of Mahon has a fine strategic position.

N.B.—Valencia is as large as Portsmouth, and Malaga is as large as Brighton.

4. The country is a very compact, lofty, treeless tableland, isolated by the great buttresses of the Pyrenees and the Sierra Nevada, and by the Mediterranean and the Atlantic.

1. The compactness causes the central parts to be a considerable distance from water, and the tableland comes so near to the sea in many places that communication inland from the coast is extremely difficult.

N.B.—Its shape is rather like a 'bull's hide,' with the head at Gibraltar.

5. This tableland is crossed by parallel ridges, called Sierras, the depressions between which are generally narrow valleys drained by very rapid rivers.

1. Communication across the Sierras from valley to valley is very difficult, and there are innumerable caves, which shelter robbers and smugglers. Cf. also the smuggling through the little independent state of Andorra.
2. In the Douro basin there is the plateau of Old Castile round Valladolid, and in the Tagus basin that of New Castile round Madrid.
3. In the Ebro basin there is the low plain of Aragon, and in the Guadalquivir basin that of Andalusia.

N.B.—The alternation of mountain and valley is very marked—Cantabrian Mountains and the Douro river, Guadarrama Mountains and the Tagus, Toledo Mountains and the Guadiana, Morena Mountains and the Guadalquivir, with the Nevada Mountains to the south.

6. The main water-parting is nearer to the Mediterranean than to the Atlantic, and therefore all the long rivers, except the Ebro, empty into the latter.

1. The Tagus is the longest and the most important; but the Douro and the Guadiana are more than twice, and the Ebro is nearly twice, as long as the Thames.
2. All of them are navigable for some miles, and small boats can reach Cordova and Logroño; but, as a rule, they are much too fast and too shallow for navigation, and too much sunk below the general level to be of much use even for irrigation.

7. The climate is one of the driest in Europe, in spite of the presence of sea on every side; and it has been made still drier by a foolish destruction of the forests.

1. In Portugal and along the north coast there is a heavy rainfall from the Atlantic; but the edges of the plateau are so high, so abrupt, and so near the sea, that nearly all the moisture is condensed out of the winds before they ever reach the interior of the country.
2. The nearness to the Sahara and the narrowness of the Mediterranean expose the southern half of the country to intense heat, though the height of the plateau causes the winter temperature to be low.

3. The extremes are very great. For instance, skating is quite common at Madrid; bananas, sugar-cane, and even the date-palm ripen in the Guadalquivir basin.

N.B.—Fortunately the south winds have to cross the Sierra Nevada, or 'Snow Range,' which is more than three times as high as Snowdon.

Vegetation and Minerals.

1. The vegetation, of course, varies with the climate, but the combination in most districts of great heat with small rainfall makes irrigation of very great importance.

1. The unirrigated basin of the upper Guadiana is a desert; while the famous 'huertas,' or gardens, have made the irrigated portions of Murcia, Valencia, and Granada, very fertile and thickly populated.

N.B.—In the 'huertas' belt the rock has to be blasted, and powdered with hammers, to form soil.

2. The pastoral resources are more famous than valuable, but the country does still produce good sheep, cattle, and horses.

1. Fine merino sheep thrive on the stimulating herbage of the Toledo Mountains.
2. The wild cattle of the Guadarrama valleys supply victims for the bull-fights.
3. Andalusian mares are very valuable; pigs are numerous in the Portuguese oak forests, and mules everywhere.

N.B.—The most valuable forests in Portugal are of cork, which flourishes also in Andalusia and Catalonia. The latter supplies, from Gerona, the best corks in the world for champagne bottles.

3. The agricultural products include all sorts of grain, fibre, and fruit; but the characteristic products are—the vine, esparto-grass, and chick-peas.

1. Esparto loves drought, and chick-peas are the daily food of the people.

4. The vine is the most important crop both in Spain and in Portugal.

1. In the Douro valley, where the vines are roasted for two months in summer, they produce port wine ; and Tarragona 'port' is produced in the same latitude on the east side of the country.
2. The more marine climate of Xeres produces sherry, which is exported in very large quantities from Cadiz.
3. Immense quantities of wine are also exported to France from Malaga, Alicante, and Valencia, for 'blending' purposes.
5. The other crops are comparatively unimportant.
 1. The fruits are grown along the Mediterranean coast, in Andalusia, and in the Balearic Islands, *e.g.* Seville oranges, Malaga lemons, Barcelona nuts, Elche dates. Cf. p. 62.
 2. The chief fibre is tobacco, which is grown in Andalusia and Murcia, Seville and Alcoy being the centres.
 3. All sorts of grain are grown—from rye to rice. The rice is grown only in the hottest and wettest parts of the south, where also large quantities of maize are grown ; the wheat is grown on the dry plateau of Valladolid.
6. The varied age and character of the Iberian Mountains makes the mineral wealth great and varied.
 1. Coal and iron, the latter of excellent quality, are found in the north. The coal-fields are in Asturias, especially round Oviedo ; and Gijon is the port. The iron is round Bilbao and San Sebastian, but Toledo still manufactures sword-blades.
 2. Copper and lead are very abundant. The richest copper-mines are at Rio Tinto and Tharsis ; and the product is exported from Huelva, which stands just opposite Columbus's old haven of Palos. The chief lead-mines are also in Andalusia, at Linares, and between Adra and Cartagena.
 3. The other minerals are mercury, salt, tin, zinc, and clay. Almaden was at one time the most important mercury centre in the world, and has given its name to valuable mines of mercury in California ; the best salt in the world comes from Setubal, and the product of Cardona and other Catalonian towns is not much inferior ; tin and zinc are mined in Galicia, and Majorca has porcelain-clay (cf. 'majolica').

Towns.

1. Only ten towns have a population of over 100,000; and of these Madrid, Barcelona, and Lisbon are much the largest.

1. Madrid is as large as Birmingham. It is the highest capital in Europe. Its only importance is political, and this has made it a railway centre.

2. Barcelona is the only good harbour within reach of the coal-fields—*via* the Ebro valley—and it manufactures cotton.

N.B.—The want of coal and the want of energy are the reasons for the backward condition of manufactures.

2. The other seven towns are Valencia, Oporto, Seville, Malaga, Murcia, Carthagená, and Zaragoza.

1. Valencia, which is the size of Portsmouth, has a silk industry in connection with its mulberry groves; and Seville and Malaga, which are about the size of Oldham, also manufacture silk, and have a fruit trade; Murcia is a characteristic huerta town; and Zaragoza commands the Ebro valley.

N.B.—Zaragoza is a corruption of 'Caesar Augusta.'

3. Vimiera, Talavera, Torres Vedras, Ciudad Rodrigo, Badajoz, Salamanca, Vitoria, Corunna, and several other places are very famous in British history.

1. The important connection of the country with British history is the reason for its being called '*The Peninsula*.' Cf. '*The Cape*.'

2. Granada was the capital of the Moorish kingdom in Spain, and contains the Alhambra Palace.

ITALY.**Surroundings and Surface.**

1. AS Italy has sea on three sides, and stands in the centre of the most important inland sea in the world most of its important towns are harbours.

1. The Ligurian and Tyrrhenian Seas, and the Gulf of Taranto, are much deeper than the Adriatic ; and the coast is much finer on the west and south, especially in the Riviera, than on the east.

2. The chief harbours are Genoa, Naples, Messina, Palermo, Leghorn, and Venice.

1. Genoa, nearly the size of Hull, owes its supremacy to its excellent harbour, its facilities for communication inland *via* the Bochetta Pass and the St. Gothard Tunnel, and its position as the centre of the seaboard railway from Marseilles to Rome. Like Venice, it was of enormous political and commercial importance in the Middle Ages, but decayed after the discovery of America—until the opening of the Suez Canal (1870) and the M. Cenis Tunnel (1871).
2. Naples, which is larger than Birmingham, has a magnificent bay under the shelter of Vesuvius ; and it was the capital of the old kingdom of Naples and the two Sicilies. The local sulphur and the Apennine sheep (cf. p. 114) have given it an industry in violin strings.
3. Messina commands all the trade through and across the Straits—the old ‘Scylla and Charybdis’ ; Palermo is the political capital of Sicily, and has a good harbour and a large wine trade ; Leghorn is the—artificial—port of Florence and Pisa.
4. Venice, which is no larger than Dundee or Oldham, has lost almost all its old importance ; but it is the natural outlet for the eastern half of the plain of Lombardy, and commands the traffic up the Adige valley.
5. Of the smaller harbours, Civita Vecchia is the port of Rome ; Spezia, a great naval station ; Brindisi, the terminus of the Overland Route to the east ; and Ancona, the best harbour (after Venice) in the Adriatic.

3. The Alps stretch across the north of the country, and defend it on the landward side.

1. They are steeper on the Italian than on the Swiss or the French side, and afford very good shelter to the low plain of Lombardy. Cf. pp. 2 and 56.

4. The general climate is much benefited by the maritime position of the country, and by the protection of the Alps ; but, of course, the continental part is drier

and has greater extremes than the peninsular and the insular parts. Cf. p. 117.

1. The south, however, suffers from the dry scirocco from Africa ; while the dryness of the north is more than compensated by the abundance of water from the Alpine glaciers.
2. The direction of the Apennines enables them to intercept all the dampest winds ; and the absence of islands towards the S.W., the wet quarter, causes a rainfall of 50 inches on the Ligurian Alps behind Genoa.
5. The surface is naturally divided into three areas—continental, peninsular, and insular.
 1. The country was, like Egypt, too long to be easily governed from a single centre ; and the different character of the surface gives the different areas different interests and habits.
6. The continental area is the plain of 'Lombardy,' which is composed of very rich alluvial soil, and sheltered on every side. It includes Lombardy proper.

1. So much mud still comes down from the Alps that the river beds are sometimes raised above the level of the surrounding country, and have to be banked in ; and the delta of the Po is every year advancing farther into the Adriatic.

N.B.—The town of Adria, which gave its name to the Adriatic because it was a seaport in the time of the Romans, is now 20 miles inland.

7. The peninsular area consists practically of the Apennines, with strips of lowland in some places between the base of the range and the sea.

1. Some of these strips, especially the Roman Campagna, the Pontine Marshes, and the Tuscan Maremma, are damp and very unhealthy.
2. As the range is nearer to the east coast than to the west, the longest rivers flow to the west.
3. The range attains in Monte Corno a height twice as great as that of Ben Nevis ; and near the source of the Tiber it divides into two, and encloses a wild plateau.

8. The insular area consists of the two important groups of islands known as the Sardinian and the Sicilian.

1. The Sardinian group includes Sardinia itself, Corsica, and Elba ; and the Sicilian group includes Sicily itself, the Maltese and the Lipari islands.
2. Sardinia and Sicily are about the same size—*i.e.* one-fifth the size of England—and both are very mountainous.
3. Between these islands there are productive sardine and tunny fisheries, and coral and sponge industries.

N.B.—Corsica belongs to France, and the Maltese group to Britain. Cf. p. 48.

9. The only large river is the Po, which is twice as long as the Thames ; but the Adige, Tiber, and Arno are important.

1. The Po is navigable for nearly 300 miles, and its Ticino and Adda tributaries are navigable up to the lakes. Piacenza and Cremona command points where the Po is easily bridged, and Ferrara commands the delta waterways.
2. The Adige is navigable up into the Tyrol, the Arno to Florence, and the Tiber to Rome ; and the Tiber valley gives access *via* Perugia from Rome to Rimini and the independent republic of San Marino.
3. The chief value of the Italian rivers is for irrigation, which is made exceptionally easy by the raising of their beds caused by the alluvium. Cf. p. 135.

Vegetation and Minerals.

1. The vegetation is generally luxuriant, owing to the cloudless sunshine and the abundant water ; but there are some drier parts, which make useful pasture for sheep, and cattle, pigs, and silkworms are found in various parts of the country.

1. The sheep feed on the dry hills of Apulia, Tuscany, and Piedmont—the latter supplying the wool factories of Turin, and the former supplying the catgut industries of Naples.
2. The cattle feed on the moist lowlands of Lombardy and along the western coast, the former supplying the ‘Gorgonzola’

cheese of Milan, and the latter fattening lean cattle imported from abroad.

3. Millions of silkworms are reared on the endless rows of mulberry trees in Lombardy, and supply the silk market of Bergamo and the silk industry of Milan.
4. The pigs roam through the chestnut forests of Umbria and Sicily.
2. The agriculture includes grain, fibre, and fruit.
 1. The two former require, as a rule, flatter land than fruit does; but all of them depend on irrigation.
3. The grain includes wheat, maize, and even rice; and the fibres include flax, hemp, and even cotton.
 1. Wheat is raised in the drier part of Lombardy, in Sicily, and in Apulia, which produces excellent wheat for macaroni; and the straw is largely used for making hats, especially at 'Leghorn' and in other Tuscan towns.
 2. The splendid irrigation of Venetia and Emilia produces crops of maize and even of rice. The maize makes the 'polenta' food of the people; and the dry climate and abundant grain, combined with railway facilities through the Alps, have led to a huge export of eggs. Cf. p. 100.
 3. The flax and the hemp are grown in the irrigated plain, the flax round Cremona and the hemp round Bologna; the cotton is grown in the extreme south, along the coast of Calabria and Sicily.
4. The fruit includes the vine, olive, chestnut, citron, and sub-tropical products.
 1. The vine grows best on the sunny slopes of the Apennines and in Sicily, especially round Florence ('Chianti'), Alessandria ('Asti'), Parma ('Felino'), and Marsala ('Marsala').
 2. The olive grows almost everywhere south of Florence, unless the elevation is too great. The best oil comes from Lucca.
 3. Oranges and lemons come from Sicily, Sardinia, and Calabria—the best oranges from Catania, and the best lemons from Messina.
5. The great defect of Italy is the absence of coal, which has retarded manufactures and increased the reckless use of wood. Cf. p. 105.

1. The scarcity of fuel is somewhat compensated by the abundance of water-power. Already quite a large number of textile industries have been started at the base of the Alps and the Apennines, *e.g.* at Biella and Lucca; and, as the use of water-power spreads, there will be probably a great development, especially in the silk trade.
2. Most of the timber which has been cut down so recklessly, has been used by the railways and the dockyards; and the destruction of the timber has materially affected the climate.

N.B.—Woods moderate extremes of temperature, increase the rainfall, and fertilise the soil—by their leaves, by checking quick radiation of heat, and by preventing the top soil from being washed away by sudden rain.

6. The most important minerals are sulphur, marble, iron, salt, borax, and silica.

1. The sulphur is most abundant in Sicily, being found round Catania, Caltanissetta, and Girgenti.
2. Italy produces the best marble and the best marble-cutters in the world, the chief quarries being at Carrara, Massa, and Brescia.
3. The iron of Elba is of excellent quality, and ore of a less valuable kind is also found in Lombardy. The port of Elba is called Ferrajo, the 'ironmongery'; Milan is still famous for cutlery, and used to be famous for 'Brescian' swords.
4. Salt is produced round the coast, especially in the Gulf of Cagliari and in the Emilian marshes.

N.B.—Cagliari also exports lead, iron, copper, and zinc.

5. Boracic acid is produced in Tuscany and in the island of Volcano. In the former it rises as a vapour from certain volcanic rocks, and in the latter it is found incrusting the crater of a 'volcano.'
6. The silica of Murano was the origin of the great Venetian glass industry.

Towns.

1. Twelve towns have a population of over 100,000, of which six are important harbours—Naples, Palermo, Genoa, Venice, Messina, and Leghorn. Cf. p. 112.

1. Of the other six, Rome is about the same size as Leeds. It has, like Venice, a deeply interesting history, and has the political importance of being the capital of Italy and of the Roman Church; but it has little commercial importance, largely because the Tiber is so choked with mud.
2. Milan has both political and commercial importance. Its central position made it once the capital of Austrian Italy, and now makes it the great railway and industrial centre. It manufactures silks and cutlery, and commands the St. Gothard Tunnel.
3. Turin is about the size of Bristol, and owes its importance both to politics and to commerce. It was the capital of the old kingdom of Sardinia; it commands the head of the plain, as Milan does the centre, and the Mont Cenis Tunnel, as Milan does the St. Gothard; and the water-power of the Alps and the Piedmont sheep-pastures have developed a woollen industry.
4. Florence—which has a population of 205,000—also owes its importance both to politics and commerce; but it is, too, very famous in the history of Art and Literature. It was in the Middle Ages an independent republic, and in modern times a capital of Italy; it stands on a navigable river in a fertile valley, and it possesses deposits of china-clay.

N.B.—Its history is connected with Dante, Petrarch, Boccaccio, Leonardo da Vinci, Savonarola, Machiavelli, Michael Angelo, and Galileo.

5. Bologna and Catania are rather larger than Brighton or Oldham. Bologna, like a number of other towns in Emilia and Venetia—e.g. Padua, Verona, Parma, Modena—is the seat of an old university; it manufactures the hemp which is grown in the district, and is an important railway junction between continental and peninsular Italy. Catania has a fruit and sulphur trade, and is the best starting-point for climbing Mount Etna.

N.B.—Italy, like Greece, is very famous for its historic ruins; and in both countries the preservation of such ruins as man has allowed to stand untouched, is largely due to the dry climate.

BALKAN PENINSULA.

Surroundings and Surface.

1. As the Balkan Peninsula has sea on every side except the north, it has certain climatic and commercial advantages; but its position is so much shut in by land, especially on the south-west, that the climate is comparatively little affected by the sea.

1. For instance, considering the height of the mountains, the rainfall is not very abundant.

2. The coast-line, except along the Black Sea, is broken up in the most remarkable manner, and fringed by innumerable islands.

1. Greece has a larger proportion of coast to surface than any other country in the world, being almost cut in two by the Gulfs of Corinth and Egina; and this makes its climate very even.

2. The islands may all be included in two groups—the Ionian Islands and the Archipelago; and the Archipelago is, again, divided into two groups—the Cyclades, which ‘Circle’ round Delos, and the Sporades, or ‘Scattered’ islands.

3. The land boundary is partly the Save and Danube, and partly the Transylvanian Alps.

1. The Danube is an excellent political frontier, but not a very good military one, though it is fairly deep, broad, and rapid; its southern bank is hard and high enough to be a good site for towns and fortresses, but the northern is low and marshy. There is an important railway bridge at Chernavoda.

4. The country is a high tableland, broken by a number of mountain ranges and a few low river plains.

1. The plain of the Lower Danube separates the Transylvanian Alps from the Balkans; that of the Maritza separates the

Balkans from the Rhodope Mountains ; that of the *Salamvria*—*i.e.* the Vale of Tempe—separates Mount Pindus from Mount Olympus.

2. The only navigable rivers are the Danube and the Maritza ; but the river valleys are very useful for communication, especially those of the Vardar, the Morava, and the Maritza, in connection with the Overland Route to Constantinople and Saloniki *via* Nish.

5. The height of the country, and the entire absence of protection against the cold north-east winds, cause the extremes of climate to be very considerable.

1. For instance, in winter Constantinople is normally 10° colder than Naples ; and the Danube is ice-bound, and its basin is covered with snow, in spite of the latitude.
2. In the sheltered places—*e.g.* on the south side of the Balkans, and in the river valleys which look southward on to the *Ægean*—the climate is very warm and even. Cf. § 2 (1) above.

Vegetation and Minerals.

1. The soil varies with the climate, being very poor on the dry exposed uplands, and very fertile in the sheltered river valleys.

1. Amongst the mountains in the north and centre there are large forests, especially in Servia and along the Transylvanian Alps.
2. The dry slopes of the Albanian, Bulgarian, and Rumanian hills are famous for sheep ; and 'Turkey' carpets are made of their wool at Sliven and Adrianople.
3. The plains and valleys are cultivated, though in a most primitive way.

2. There are several characteristic products, especially roses, plums, maize, and currants.

1. The roses are grown over an area as large as Berkshire, along the southern slope of the Balkans. The chief centres are Kasanlik and Sliven, between which is the famous Shipka or 'Wild Rose' Pass.
2. The plums are almost exclusively the product of the Morava basin ; and the maize export from the same basin and from

the plain of Wallachia is larger than that of any other country in the world except the United States. Maize is also grown on the site of Lake Topolias.

3. The currants are grown along the Gulf of Corinth, and in Cephalonia, Corfu, and Zante ; Patras is the export centre.
3. The mulberry, tobacco, wheat, and several kinds of fruit are also raised.
 1. The mulberry is widely grown in the Morea, Negropont, Rumelia, and the valley of the Isker ; and the tobacco in the basin of the Vardar, where cotton also can be grown, and round Artá and Larissa. Negropont (Eubœa) is also famous for wine.
 2. The wheat is raised mainly in Bulgaria between the Balkans and the Danube, and is exported from Varna ; but some is raised on the plain of Thessaly, and exported from Volo.
 3. Turkey exports raisins and figs, and Greece exports olives and figs. Greece also exports valonia (acorns).
4. There is an abundance of mineral wealth, but it is scarcely touched except in Greece.
 1. The causes of this are—the want of capital, heavy taxes, bad communication, insecurity of property, and the character of the people.
 2. The Greeks work lead at Laurium, iron in Seriphos, marble in Paros, emery in Naxos, sulphur in Milos, and petroleum in Zante.
 3. Salt is made at Burgas and other places along the coast ; and coal has been *found* near the important harbour and railway terminus of Saloniki.

States.

1. The configuration of the country divides it naturally into a number of states, of which Greece, Rumania, Servia, and Montenegro are independent States, while Bulgaria and Crete are autonomous tributaries of Turkey.

N.B.—Bosnia and Herzegovina, though nominally belonging to Turkey, are occupied and administered by Austria. Cf. p. 97.

2. Turkey includes Rumelia (the ancient Thrace and Macedonia), Albania (the ancient Albania and Epirus), and the European island of Thasos.

1. Constantinople, which is nearly as large as Manchester and Birmingham together, occupies one of the most important positions in the world—on the narrow Bosphorus, with the splendid natural harbour of the Golden Horn. It commands the trade between Europe and Asia, and between the Black Sea and the Mediterranean. It has also immense political and historical interest.
2. Saloniki, the second port and the second city in size, is as large as Cork or Plymouth. It is the terminus of the shortest railway route from London to Egypt, *via* the Vardar valley and the important junction of Uskub (Skoplie), and therefore may supplant Brindisi eventually as a mail station.
3. Adrianople, the only inland town of any size at all, stands in a fertile valley at the confluence of the Maritza and the Tunga, with mulberry groves and rose gardens, and near the Rhodope sheep-pastures; it manufactures scent, silk, and carpets. It is on the Orient-Express Route to Constantinople, with a branch line to the port of Dede Agach.
4. Gallipoli, which commands the Dardanelles, is the chief naval station, but shares with Scutari, Bitolia, and Yanina the morocco-leather trade. The latter three are all amongst the Albanian pastures.

3. Rumania consists of two river plains, Moldavia and Wallachia, both of which are very fertile and produce enormous quantities of maize; and, in connection with the maize and the huge forests along the base of the Carpathians, a very large number of pigs are reared.

1. Bucharest, the political capital, is larger than Newcastle or Hull, and owes its importance to its position in the very middle of the Wallachian plain.
2. Jassy and Galatz are little towns about the size of York or Reading; but Jassy has political importance as the capital of Moldavia, and Galatz has commercial importance as a great grain port, though it is losing trade to Braila.

3. Sulina and Kustenji are also important little harbours, the latter exporting cattle from the plateau ('Dobruja') which causes the sudden northward bend of the Danube.
4. Servia is a mass of forest-clad mountains, through which the important Morava valley runs, providing alluvial lands for maize, and forming a great inter-continental line of communication.
 1. The forests of beech and oak and the maize fields cause the great industry to be the rearing of pigs; and the plum-orchards produce excellent prunes.
 2. Belgrade, at the confluence of two navigable rivers, and commanding the Morava valley traffic, is the political capital; but it is no larger than Ipswich or Hastings.
 3. Nish is a little town the size of Canterbury, but it is a very important junction on the Orient-Express Route.
5. Montenegro is a mountainous little country, the capital of which is the village of Cetigne.
 1. The barrenness of the land causes constant emigration, *via* the little ports of Antivari and Dulcigno.
6. Greece and Bulgaria illustrate some extremely interesting points in political and historical geography.
 1. Political geography treats of the earth as occupied by different peoples; and, therefore, it is chiefly concerned with questions of war and of national frontier.
 2. Historical geography treats of the earth as moulding man's character and actions.
7. Both the coast and the surface of Greece are remarkable.
 1. The coast is at least twice as long, in proportion to the size of the country, as that of Great Britain; the surface is covered with masses of mountains, most of which run out into the sea as bold peninsulas; and the sea round is comparatively so small that the climate is thoroughly continental, *i.e.* the air is dry, and the sky is generally cloudless.
 2. The sea surroundings developed a race of sailors and colonists, for it is easiest to conduct even the *domestic* trade by sea; and the winding bays and wooded islands afforded every chance to those whom their trade tempted

into piracy. Moreover, the belt of mountains along the north so isolated the people that they naturally expanded into Asia—by the bridge of islands across the *Ægean*.

3. The surface and climate made them independent and patriotic. The valleys are so small that they could easily be governed from a single centre, which strongly developed 'clan' spirit; they are so near to one another that intercourse could not be avoided, which encouraged commerce; and they are so numerous that the rivalry between valley and valley was very strong. The climate encouraged an open air athletic life, in which this rivalry found scope for itself; and common sports,—aided by common religion, a common language, and a common isolation from the rest of Europe—developed very strong patriotism.

8. Athens, with its port of the Piræus, is about as large as Dundee or Bolton; the other ports, Patras, Missolonghi, Nauplia, and Hermopolis, are quite small.

1. Athens practically monopolises most of the industries of Greece, but its characteristic trade is in honey from Mount Hymettus.
2. The importance of Patras, the currant port, has been increased by the opening of the ship canal across the isthmus of Corinth.
3. Hermopolis is a free port on the island of Syra, and its characteristic trade is sponges.

9. Bulgaria is a typical 'Buffer State.' It consists of the range of the Balkan Mountains and their two slopes—the northern slope towards Russia, and the southern slope towards Turkey; the Shipka Pass joins the two.

1. The north slope is Bulgaria proper, and the south is the extremely fertile plain of Eastern Rumelia.
2. Varna is the seaport and railway terminus of the northern slope, and Burgas of the southern; and the former gets the Danube trade from Rustchuk by rail.
3. Sofia, the capital, which is no larger than Oxford, is perched up amongst the mountains of the interior, just between the Maritza and Morava valleys; and thus it commands the railway from Belgrade to Constantinople, *via* Philippopolis, the old capital of Eastern Rumelia.

N.B.—The sites and the history of Vidin, Plevna, and Silistria are typical of the advanced posts of a 'Buffer State.'

NORTH AMERICA.

Introductory.

1. NORTH AMERICA is much the most important area of the New World, owing to its size, its natural wealth, and the number and character of its inhabitants.

1. It is more than twice as large as Europe, and nearly half as large as Asia.
2. Its natural wealth, both vegetable and mineral, is simply enormous.
3. It has a population of about 90,000,000, more than two-thirds of which consist of the mixed race of industrious and ingenious 'White' men who inhabit the United States and Canada.

2. Like the sister continent of South America, it takes its name from Amerigo Vespucci, though he had nothing to do with its original discovery or its development.

1. It seems to have been known to the old Greeks and Romans under the name of Atlantis, which Plato describes as an 'island larger than Africa.'
2. About the year 1000 A.D. Norwegians from Iceland, under Eric the Red and his son Leif, settled in Greenland and along the New England coast, and for at least a century the settlement was so successful that tithes were even sent from time to time to the popes of Rome.
3. For its re-discovery we owe most to Columbus,—after whom the town of Colon (Aspinwall) is called—John Cabot, and

Cortex; and for its development we owe most to the French missionaries and the Puritan refugees of New England.

3. The structure of the continent presents some interesting points of comparison with that of its neighbours.

1. Thus, in South America we see the same general system—the western mountain, the eastern highlands, the central plain, the archipelago to the N.E., the direction of the rivers, *e.g.* Mackenzie and Orinoco, St. Lawrence and Amazon, Mississippi and La Plata.
2. In Eurasia, on the other hand, we see various resemblances in particular features, the Scandinavian plateau corresponding to the Laurentian, the British Isles to the Newfoundland group, the Baltic lakes to the Great Lakes, the 'Black Earth' district to the prairies, the steppes to the western plains.

General Surroundings.

1. As North America is surrounded by sea everywhere except for the few miles across the isthmus of Panama, the abundance of sea ought to affect its climate, its commerce, and its defence.

1. It ought to make the climate more moist, and therefore more even, than it would otherwise be; but much will depend on the character of the sea, the direction of the prevailing winds, and the size and position of the mountains.

N.B.—Frozen sea may be regarded as land.

2. It ought to tempt the inhabitants into various sea industries, *e.g.* fishing, such as lead on to ocean traffic.
3. It ought to protect them from the wars and the pestilences of other continents, though it may isolate them politically.

2. The land boundary is so very small, and so much detached from the general mass of the continent, that it can be practically ignored,—even commercially, in view of the probable completion of a ship-canal across it.

1. The rival routes for the canal were from Greytown to Brito, and from Colon to Panama. The latter is much the shorter (about 45 miles), but it involves a vile climate and an elevation of nearly 300 feet ; and the difficulties of excavation and of controlling the sudden floods in the Chagres torrent are involving enormous expense.
2. The Nicaragua route is four times as long, but its highest elevation is only 150 feet ; it has a much better climate, and there are at least 120 miles of waterway already provided by Lake Nicaragua and the San Juan river.
3. Both routes would save about 6000 miles of sea between London and San Francisco, and 9000 miles between New York and San Francisco ; but neither of them has good ocean harbours, and neither of them is free from grave dangers from earthquakes. For instance, the whole town of San Salvador has been repeatedly destroyed by earthquakes.

3. Owing to the number of large openings, especially in the north-east, which break up the coast into a succession of peninsulas, North America has more coast in proportion to its size than any other continent except Europe.

1. For instance, it is not half the size of Asia, but it has two-thirds as much coast, though, of course, in both cases the north coast is more or less useless because of the cold.
2. The west coast is much steeper and much less indented, and has much deeper shore-water, than the east coast. It is also the warmer, as the cold Labrador current runs between the Gulf Stream and the east coast.
3. There are numerous harbours, some of which are very large and very safe, and this makes transport of goods easy and cheap. From Labrador to the mouth of the Chesapeake, and from Alaska to the mouth of the Columbia, the supply of good harbours is quite extraordinary.
4. On the Pacific coast south of the Columbia River, harbours are very few and—with the exception of San Francisco—very poor ; but that part of the coast is backed—except in California—by a region of very little commercial value, where good harbours would be practically wasted.
5. The harbours on the Atlantic coast south of the Chesapeake were not naturally very good, but they have been immensely

improved by dredging and building, and the extreme fertility of the region has amply repaid the outlay.

6. Even the interior of the continent, at all events towards the east, is within easy reach of the commercial—if not of the climatic—advantages of the sea. For instance, wheat has been shipped direct to Liverpool from Duluth, which is a fresh-water port—like Chicago—*2000 miles from the ocean*.
7. The low sandy parts of the Atlantic shore attract no commerce, but offer admirable sites for watering places, cf. Atlantic City.

Islands.

1. The islands fall into three groups—Arctic, Atlantic, and Pacific.

1. The Arctic archipelago has much the largest total area, and includes Greenland, which is the largest island in the world, being eight or nine times as large as Great Britain.
2. The Atlantic islands are much the most important, and are distributed in two large groups—the Canadian and the West Indian, and in two small groups—the Bermudas and the Bahamas.

2. The Arctic islands have bays admirably adapted for harbours, soil of great natural fertility, and abundance of minerals; but at present they are rendered useless for practical purposes by ice.

1. They have been the scene of heroic efforts to discover a 'north-west passage' to Asia; and in recent times Parry reached about $81\frac{1}{2}^{\circ}$ N., Markham and Lockwood beyond 83° N., and Nansen and Johansen beyond 86° N.

N.B.—None of the islands, except Greenland, are mountainous.

3. Besides the groups of islands mentioned above, the Atlantic coast is fringed throughout almost its entire length with small islands and banks—to such an extent that in many places there is really a double coast-line.

1. This fringe of islands is practically a line of sand-dunes caused by the Atlantic waves breaking in shallow water,

Lawrence system and ship-canals. Lake Superior alone is about the size of Ireland, and Lake Huron and Lake Michigan are not very much less; Lake Ontario is about the size of Wales, and Lake Erie is half as large again.

2. The trade on them is enormous, but they are subject to dense fogs and terrible snowstorms. Cf. pp. 53 and 141.
3. The difference between the level of Lake Superior and that of Lake Erie is only 30 feet, and there is no difference between the level of Lake Huron and that of Lake Michigan; but there is a difference of over 300 feet between Lake Erie and Lake Ontario, half of which is accounted for by Niagara.
4. There is a complete series of canals on the Canadian side, the Welland going round Niagara; the only canal on the United States side is the Sault (pronounced *Soo*) St. Mary, which joins Lake Huron to Lake Superior.

N.B.—The international boundary runs up the middle of all the lakes except Michigan, which is entirely in the United States.

5. As the sea is the source of all rain, these great inland seas ought to supply abundance of rain to the centre of the continent; but the winds do not blow regularly inland. Cf. p. 8.

1. When the cold heavy air of winter sinks down over the Great Central Plain, the warm light air cannot penetrate inland with its burden of rain.
2. Along the shore even of the Great Lakes, however, there is sufficient moisture to encourage a dense growth of timber, which supplies the material for the hundreds of trucks and millions of flour-barrels used in the huge grain trade of the prairies. Cf. p. 132.
3. Sudden local changes of height increase the rainfall, *e.g.* on the *Black Hills*, which have rain enough to be thickly forested; cf. *Black Forest*.

General Surface.

1. The mass of North America consists of a huge plain shut in by highlands on both the east and the west.

1. The most important feature of the western highlands is the range of the Rocky Mountains, which have a very gradual

slope inland; and the most important feature of the eastern highlands is the range of the Appalachian Mountains, which also have a very gradual slope inland.

2. The Appalachians are not half the length or the breadth or the height of the Rockies, but both systems run north and south—not, like the systems of the Old World, east and west. Fortunately, the smaller system was the one opposed to European immigration.
3. The fact that both systems run north and south, causes them to form a very marked barrier to any Trade or Anti-Trade winds blowing inland off the Atlantic or the Pacific; and the fact that both systems have a very gradual slope inland and a much steeper slope seaward, causes the rivers of the Great Central Plain to be much longer and more useful for navigation than the rivers of the coast regions.

2. The Great Central Plain is divided into two parts by a ridge which runs across it from east to west in the latitude of Lake Superior.

1. The northern edge of this ridge is called the Height of Land; it extends on for a long way parallel to the north bank of the St. Lawrence, and the plain slopes down from it to the Arctic Ocean and Hudson Bay.
2. The southern edge is called the Great Divide; it extends on along the south bank of the St. Lawrence, and the plain slopes down from it to the Gulf of Mexico.
3. At the highest point the ridge is not higher than Dartmoor or the Pentland Hills, and therefore presents little or no barrier to the passage of winds northward or southward; but it is the watershed of the Mississippi, the St. Lawrence, and the Red River. Cf. the Russian water-parting, p. 83.

3. In both systems of highlands there are large areas of plateau, but those in the west are much more important than those in the east.

1. The Laurentian plateau consists mainly of the barren peninsula of Labrador, and has been 'weathered' down in the course of ages to a quite insignificant height. It is probably the oldest piece of land in America.
2. The Great Western plateau lies between the Rocky Mountains and the series of ranges that skirt the Pacific coast from the north of British Columbia to the Gulf of California.

3. The Mexican plateau is similarly wedged in between the Rocky Mountains and the coast range of the Sierra Madre.

4. The Great Central Plain consists mainly of 'plain' and 'prairie,' but it merges in the barren tundras of the extreme north and in the Mississippi swamps of the extreme south. Cf. p. 145.

1. The prairies are practically the area enclosed and watered by the Saskatchewan, the Red River, the upper Mississippi, and the Missouri, *i.e.* roughly, from Edmonton and Winnipeg to St. Louis and Chicago.
2. They are huge natural meadows on which the rainfall is too small, the glacier-ground soil too fine, and fires are too frequent, for forest growth, though trees grow well on them when protected from fire.
3. The plains lie between the prairies and the Rocky Mountains and are higher, drier, and less fertile than the prairies. They owe their name to their boundless views, *not* to their precise surface-form.

5. Between the Appalachian Mountains and the Atlantic there is a strip of low plain which is politically very important, as it contains all the diverse interests represented by such cities as Boston, New York, and Philadelphia.

1. It is about 900 miles long from north to south, and—except for the break marked by Long Island—it is on the average about 200 miles wide.
2. The steepness of the Appalachians on the Atlantic side, the low level of the plain itself, and the heavy rainfall off the Gulf Stream, cause large areas of it to be very marshy.
3. The chief cities stand either along the inner edge of the plain, *e.g.* Augusta, Raleigh, Columbia—where water-power is developed by the rivers falling on to the plain, or along the outer edge, *e.g.* Norfolk, Wilmington, Charleston—where bays and estuaries offer sites for harbours.

N.B.—A few cities, on tidal rivers, combine the advantages of both situations, *e.g.* Philadelphia, Baltimore, Richmond.

Mountains.

1. There are three distinct mountain systems in North America—the Cordilleran, the Appalachian, and the Laurentian.

- 1.** The Laurentian is the only one that runs—like the mountains of the Old World—from east to west, and it was probably of great climatic importance in past ages; but it has been so much weathered away that it is now quite unimportant, being in most places no higher than the Sidlaw or the Cotswold Hills.

2. The Cordilleran system runs from Alaska to the Isthmus of Panama, where—after a break of about 100 miles—it is resumed in the Andes.

- 1.** It consists of several parallel ranges, separated by a plateau with an average elevation of one mile above the sea-level, *i.e.* higher than Ben Nevis.
- 2.** The width of the whole system varies from about 400 miles at each end to about 1000 miles in the centre, *i.e.* in the latitude of the Great Basin and of the great outward curve of the Pacific coast.
- 3.** While the greatest width is therefore in U.S.A. territory, the highest points and the only active volcanoes are at the two ends—Mt. Logan and Mt. Elias in the north, and the Peak of Orizaba and Mt. Popocatepetl in the south. Mt. Logan is six times as high as Scaw Fell or Ben Lomond.
- 4.** The most important range in the system is that of the Rocky Mountains, which run along the eastern edge from Alaska to the Isthmus of Tehuantepec.
- 5.** The most important of the western or coast ranges, which form a more or less continuous series under various names, are the Sea Alps, the Cascade Mountains, the Sierra Nevada, and the Sierra Madre.

3. The Rocky Mountains proper separate the Great Central Plain from the Great Western Plateau, thus forming the main water-parting of the continent.

1. The chief U.S.A. peaks are those of Mt. Lincoln, and Mt. Harvard, which are more than three times the height of Ben Nevis.
2. The best-known, but by no means the highest, Canadian peaks are those of Mt. Brown (9000 feet) and Mt. Hooker (8000); and the famous Wapta or 'Kicking-Horse' Pass, which is just below Mt. Hooker, is a mile above sea-level.
3. The Wapta Pass is the route used by the Canadian Pacific Railway, and is easier than any U.S.A. route across the Rockies. One of the U.S.A. lines, the Northern Pacific, crosses them (by the Mullen Tunnel) about 200 feet higher than the C.P.R.; and another, the Union Pacific, crosses them (by the Evans Pass) nearly 3000 feet higher than the C.P.R.
4. The coast ranges are continuous except for the gaps by which the great plateau rivers—the Fraser, Columbia, Sacramento, San Joaquin, and Colorado—reach the sea.
 1. The great height and the direction of these ranges cause them to present a very complete barrier to west winds off the Pacific, which would otherwise carry their precious burden of rain far inland. Thus, the 'Great Basin' is partially a desert.
 2. Mt. Logan, Mt. Elias, and Mt. Fairweather are the most important peaks in the Sea Alps, and Orizaba and Popocatepetl are in the Sierra Madre. Mt. Fairweather, the smallest of the five, is five times as high as Scaw Fell or Ben Lomond.
 3. The 'Great Basin' is a huge area of inland drainage shut in by a double range of mountains on each side—the Coast Range and the Sierra Nevada on the west, and the Rocky Mountains and the Wahsatch on the east; and, as all surplus water has to be got rid of by evaporation, what is left behind becomes very saline, as in the Great Salt Lake.
5. The Appalachian system consists of the three parallel ranges of the Alleghany Mountains and the detached 'Catskill,' 'White,' 'Green,' and 'Adirondack' groups.

1. The name 'Appalachian' really belongs to the valley between the two main Alleghany ranges—the Alleghanies proper and the Blue Ridge.
2. The highest peak, Black Dome, is about twice as high as Scaw Fell or Ben Lomond.
3. The six great Atlantic rivers all cross the Old Appalachian belt at or near its low and narrow central part; and the broken character of the system there has given great facilities for railway construction inland from the Atlantic coast, especially from New York. Cf. pp. 139 and 172.

Rivers.

1. The Rocky Mountains form the great water-parting of the continent, but the Appalachians also have an important, though much smaller, river system.

1. As both these watersheds are outside the tropics, they must be dependent for their regular supplies of rain and snow on south-west Anti-Trade winds; but, owing to the great difference in height and in distance from the sea, the snow will melt five or six months sooner on the Appalachians than on the Rockies. Cf. p. 137.
2. Owing to the height of the coast mountains and the breadth of the Great Western Plateau, however, the south-west winds from the Pacific become so dry before they reach the Rockies that the rainfall even on the highest peaks is very small, and there are almost no glaciers.
3. Moreover, there are no regular winds blowing inland off the Atlantic; and the Appalachians are not high enough to store the moisture that does reach them regularly from the Gulf of Mexico, in the form of glaciers at all.

2. The position and the direction of each watershed further affect the character of the rivers.

1. Those which flow westward from the Rockies, are true 'plateau' rivers, flowing through deep cañons and being of very great length compared with their volume.
2. The rivers of the Great Central Plain, on the other hand, have their beds sometimes raised by alluvium even above the level of the surrounding country; and they drain, water, and provide transport for a huge area of plain.

1. The Nelson-Saskatchewan will become more important, especially with the development of traffic *via* the Hudson Bay; but the marvellous extension of railways, especially in U.S.A., is partially killing river traffic all over the continent.
8. The Mississippi has the most important basin in the New World, draining an area nearly half as large as Europe; and it is the most important basin in the whole world that is entirely in temperate latitudes.
1. Unlike the Hoangho and the Yang-tsi-kiang, it drains from north to south, not from west to east; and this gives it a much greater variety of climate, with the accompanying variation of products.
 2. It has a similar advantage over the Amazon, and also has a much healthier climate and large accessible supplies of coal and iron—*i.e.* fuel and machinery, especially for railways.
 3. Like the Volga, the Mississippi itself rises at a very low elevation, and therefore its pace is not great, in spite of the Missouri and its other mountain-born tributaries; the average fall from its very source on the Height of Land to the Gulf of Mexico is not more than 6 inches per mile, and south of the Falls of St. Anthony it is much less.
 4. As the river-system is entirely destitute of lakes, however, an enormous amount of alluvium is brought down to the mouth, and the tide there is not strong enough to keep the waterway clear. The mud discolours the sea for 15 or 16 miles out, but a quantity is also deposited, especially by the Arkansas tributary, in the bed of the river. This raises it above the level of the surrounding country, so that the banks have to be protected by artificial 'levées.'
 5. The Arkansas, like the Missouri, rises at a height of more than 12,000 feet on the west, *i.e.* the windward, side of the Rocky Mountains proper.
9. The Missouri is to the Mississippi what the Inn is to the Danube, and what the Jumna is to the Ganges—a tributary longer than the main stream.
1. The distance from St. Louis up to the source of the Missouri is nearly 3000 miles, while that up to the source of the Mississippi is not 1500 miles.

2. The river can be navigated right up to the foot of the Rockies, the head of navigation above Fort Benton being about 4000 miles from the Gulf of Mexico.
3. So much of the original volume is lost, however, by evaporation and owing to the porous character of the soil, that the Missouri contributes very little more than the Mississippi does to the joint river at St. Louis.

10. The Ohio is in some ways the most important part of the Mississippi basin, although it is only one-third the size of the Missouri.

1. It has much the heaviest rainfall—sometimes, in the absence of lakes, causing disastrous floods—and the richest mineral wealth.
2. It is navigable—except for the Louisville rapids, which are avoided by a canal—for its entire length, *i.e.* up the confluence of the Alleghany and the Monongahela.
3. The Alleghany, again, is navigable from Pittsburg almost up to its source, and is connected by canal with Lake Erie and the St. Lawrence basin generally.

11. The Hudson is not nearly even half as long as the Ohio, and is frozen in winter, but it is a very important international route.

1. It is navigable for about 150 miles—up to Albany—and its valley has given very great facilities for railway construction, especially *via* its Mohawk tributary.
2. It connects New York *via* the Erie lake and canal with the grain and pasture areas of the Great Central Plain, and *via* the Champlain lake and canal system with the harbour of Montreal.
3. It is so beautiful that it is called 'the American Rhine,' and it supplies New York with a rich annual harvest of magnificent ice.

12. The St. Lawrence rises, like the Mississippi, at a very low elevation on the Height of Land, where it receives the first of its many names, St. Louis; and its average fall per mile for 2000 miles—deducting the 300 feet of the Niagara Falls and rapids—is practically imperceptible.

3. The orange-groves of Florida are sometimes severely injured by north winds in winter, when those of Carolina are completely sheltered by the Alleghany Mountains.
4. The effect of the sea may also be further illustrated.

1. St. Louis is much hotter in summer and colder in winter than Washington, which is in the same latitude ; summer frosts are quite common and very dangerous among the wheat-fields of Manitoba, but are unknown in Vancouver Island, which is in the same latitude. So, San Francisco is cooler than New York in summer. Both are on the sea, and New York is the farther north ; but the prevailing winds at San Francisco are 'sea' winds, while at New York they are 'land' winds.
2. The average rainfall along the west coast from about San Francisco up to Alaska, and along the east coast from about Galveston up to Labrador, is always over 40 inches ; in the interior of the continent it is always under 20 inches, and sometimes under 10.

The precise amount depends on the character of the winds and of the mountains or other condensing medium. For instance, at Vancouver, which is just in the centre of the Anti-Trade region, the rainfall is about 60 inches ; at Winnipeg, which is in the same latitude about 1100 miles inland, it is 16. The result is that British Columbia is covered with dense timber, while Manitoba is treeless. Cf. § 2 (1) above.

As there are no mountains in the north-east to precipitate moisture in the form of rain, it is precipitated by the cold Arctic winds in the form of snow, and the snowfall increases with the moisture. At Winnipeg it is about 60 inches, while in the triangle shut in by the Great Lakes, the Hudson Bay, and the Gulf of St. Lawrence, it rises to 160.

N.B.—10 inches of snow = 1 inch of rain.

3. The cold Labrador current makes the north-east corner much colder, and gives it a less rainfall, than the north-west corner, which enjoys the full influence of the warm Japan Stream. For instance, Sitka has the same winter temperature as New York, which is 1200 miles farther south.

The Gulf Stream makes Disko Bay, which is well within the Arctic circle, warmer in winter than the Hamilton Inlet, which is 1000 miles farther south, but chilled by the Labrador current.

Where cold and warm currents meet, as off the Newfoundland Banks, there are constant fogs. Cf. the Great Lakes, p. 141.

5. The amount of moisture carried inland depends, however, on the winds—N.E. Trades in the Tropics, and S.W. Anti-Trades outside the Tropics.

1. The north-east Trades deposit over 80 inches of rain every year along the Atlantic coast of Honduras and Nicaragua ; but, of course, there are no regular winds blowing to the 'tropical' part of the Pacific slope.
2. The south-west Anti-Trades deposit over 60 inches along the Pacific coast of Oregon and Washington, where the mountains are so near the sea that they meet the wet winds at their wettest : but, of course, there are no regular winds blowing to the 'temperate' part of the Atlantic coast.
3. Owing to the barrier of the Sierra Nevada, there is less than 10 inches a year in the Great Basin, and for similar reasons there is less than 20 inches—falling almost entirely in summer—over the whole of the prairie.

6. This absence of moisture inland has many results.

1. It makes the climate very healthy, but causes great extremes.
2. It is very advantageous for flour-milling, but disadvantageous for spinning. The cotton-spinners of Lowell have to charge their mills with vapour artificially in order to compete with those of Manchester, but the millers of Minneapolis can compete even with those of Buda-Pesth. Cf. p. 99.
3. The wet side of the mountains produces timber, while the dry side produces pasture ; the dry heat of the interior produces wheat, while the damp heat of the coast produces cotton. Cf. the timber of British Columbia and Oregon, the pasture of Alberta and Wyoming, the wheat of Manitoba and Minnesota, and the cotton of Georgia and Carolina. Cf. p. 3.

Vegetation.

1. The vegetation of North America depends, of course, on soil and climate ; and it may be roughly classified under five heads—

1. The Arctic Region.
2. The Cordilleran Plateau.
3. The Central Plain.
4. The Temperate Coast Region.
5. The Tropical Coast Region (including the West Indies).

2. The Arctic Region extends over almost a quarter of the continent; but it consists of 'tundras,' and therefore produces only dwarf vegetation—stunted trees, mosses, etc.

1. The summer is hot enough, partly owing to the low level, but it is too short to develop properly the grains and roots which civilised man and his domestic animals need.
2. The length of the winter and the intensity of the cold cause the animals to grow additional fur; and fur is, therefore, the main commercial product of the region, the vegetation being too stunted to have any commercial value.
3. The recent development of gold-mining along the Yukon has suggested the existence of considerable mineral wealth in all the north-west part of the region; and the climate and the conditions of life make it an admirable resort for people in search of health or sport during the short, bright, warm summer.

3. Like the Arctic Region, the Cordilleran Plateau—which extends over nearly one-fifth of the continent—is at present practically a desert; but the cause is drought, not cold.

1. Its mountain barriers cut it off from both the climatic and the commercial advantages of the sea, and its dryness and its height combined give it terrible extremes of climate; but the very same causes give it pure air, constant sunshine, and convenient markets among the neighbouring mining centres of the Rockies.
2. In most places the soil is deep, and has produced so little vegetation of any kind that it has much fertility stored in it—waiting for water; and irrigation could be provided for a considerable area by storing the rain that does fall in winter on the mountains, instead of allowing it to run to waste in the thirsty soil during the time that plants are not growing.

3. The places where the rapid evaporation has caused the soil to be encrusted with salt, may be regarded as utterly useless.
4. The Central Plain includes all the 'plains' and prairies,' *i.e.* from the Michigan peninsula to the Rockies, and from the southern limit of the Tundras to the northern limit of the Gulf lowlands. Cf. p. 132.

1. These 'plains' are a huge tract of rolling grass lands, stretching parallel to the Rockies from Alberta to Texas; and on them the air is clear and bracing, the ground is firm and dry, the water-supply is sufficient, the grass is rich, and the price of land is very low. In fact, they form ideal pastures—for sheep on the higher, and for cattle on the lower levels. Cf. p. 12.

2. The 'prairies' lie to the east of the plains, and are lower, warmer, and richer. They are practically a continuous stretch of low and level land, far enough from the sea to be dry, but with enough vegetable matter in the soil to retain moisture; they have been enriched for centuries with the ashes of prairie fires and the bones and other refuse of beasts and birds, until their fertility is extraordinary; they have been in cultivation for very few years, especially in Canada; and they have really remarkable facilities for transport. Cf. p. 11.

3. They have two disadvantages—they are subject to summer frosts and to floods. Both are mainly due to the absence of trees to check radiation at night, and the absence of mountains to exclude the cold Arctic winds; and both can be greatly lessened by planting trees.

The frosts can also be rendered harmless in the meantime by 'smudge-firing,' *i.e.* burning damp straw (which is of no value in the grain districts) along the north side of the grain fields on frosty nights.

4. The species of grain varies with the heat and the moisture. In the north, where the dryness and the extremes of climate are the greatest, it is wheat; in the centre, where the extremes are less, and where the Mississippi valley has an exceptionally good water-supply, it is maize; and in the south, where the climate varies least, and where the surface is a swamp, it is rice. Cf. the Carolina rice.

5. The 'Temperate' Coast Region extends from the

St. Lawrence to the Rio Grande in the east, and from Alaska to Lower California in the west.

1. Both divisions consist of a low coastal plain backed by mountains ; but the plain is very much wider, and the mountains are much lower, in the east than in the west.
2. Both have a more even climate, a less fertile soil, and a greater variety of crops than the Central Plain has ; and the west has a rather milder climate and a rather richer soil than the east.
3. The great distinction between the two is that, owing to the direction of the regular winds and ocean currents, the rainfall increases from north to south in the east, but from south to north in the west. South California is a sandy desert, while Florida is a sandy swamp.

6. This 'Temperate' Coast Region is so important that it needs to be treated with more detail.

1. The Atlantic section of it may be roughly divided into three distinct areas—a forest area, from Chesapeake Bay up to the Laurentian Mountains (cf. the name *Penn-sylvania*) ; a fibre area, from Chesapeake Bay down to the Rio Grande ; and, intruding into the fibre area, the fruit area of Florida.

7. The forest area is the sphere of the heaviest snow-fall, on which the 'lumber' trade largely depends.

1. The snow is the main cause of the forest ; it also makes excellent temporary roads through the forest in winter, and when it melts in spring, it carries the 'logs' down to the saw-mills.
2. The trees include both evergreens such as pine and spruce, and deciduous trees such as birch and maple ; and the chief 'lumber' States at present are Quebec, Maine, and New Brunswick.

N.B.—The northern limit of forest, and the southern limit of 'Barren Lands, are determined simply by the length and the warmth of the summer. Cf. p. 144.

3. Both New England and Lower Canada owe much of their subsequent prosperity to the 'lumberers,' who cleared the land, made roads, and built bridges for the farmers who were destined to follow them. The cleared land was devoted to 'mixed' farming.
4. The soil is not very fertile, having been deposited by glacial action, but for that very reason it does not wear out easily

under constant tillage ; and the climate, being more even than farther inland, allows a greater variety of crops. For instance, the lowlands of Ontario produce cheese, while those of New York produce hops ; the peninsula of Nova Scotia produces apples, while the Delaware peninsula produces peaches.

8. The fibre area commands the markets of the world for the best cotton and the best 'pipe' and 'cigarette' tobacco.

1. The tobacco is grown on the higher and more northerly parts, *i.e.* the south-east corner of the Alleghany Mountains, the chief states being Kentucky and Virginia. This area was never covered with glacier ; and, though the Kentucky limestone is still very fertile, the Virginian soil is growing so perceptibly poorer that Richmond has quite lost its pre-eminence in the tobacco trade—in favour of Louisville.
2. The cotton is grown on the lower and more southerly part, from South Carolina to Texas, but is of two kinds—'sea-island' or long-staple, and 'upland' or short-staple. The long-staple cotton is grown on the low islands off Georgia, South Carolina, and Florida, where the warm, damp air is so favourable to the plant that its product is the finest in the world, and is used for all the best French and Swiss muslins. The short-staple cotton is much the more abundant, growing over all the low land in the south of the Mississippi basin ; but it is much the less valuable.
3. Florida is a sandy swamp enjoying such advantages in latitude and from the Gulf Stream that it is an ideal place for semi-tropical fruit. Even pine-apples grow to great perfection, but the chief crop is oranges.

9. The Pacific section of this temperate coast may also be roughly divided into three areas.

1. From California northwards there is an area of timber and fruit, the pears being specially famous. Forests cover all the west, *i.e.* the wet, side of the Cascade Mountains ; and the influence of the Japan Stream and the Anti- Trades makes the range of temperature so little that some of the trees, *e.g.* the Douglas fir, grow to an enormous height—300 feet.
2. In the centre there is a grain and fruit area. Between the Sierra Nevada and the Coast Range there is a valley about 400 miles long and from 60 to 70 miles wide. The northern

half of it is splendidly watered by the Sacramento, and the southern half by the San Joaquin; and the dry heat is particularly favourable to the production of wheat, wine, and wool. The sheep naturally occupy the highest, and the wheat occupies the lowest land; and the vineyards cover the gentle slopes between the two.

N.B.—There is a 'fan of detritus' at the mouth of nearly all the Californian valleys which greatly facilitates irrigation.

3. In the south there is a practically useless strip—from S. Diego southward. It comes within the area of the N.E. Trade winds, and therefore has no regular winds bringing rain to it. The heat of the tableland itself, however, is so great that it is the cause of a south-east monsoon, which brings the only considerable supplies of rain to the Pacific coast of Central America

10. The vegetation of the Tropical coasts and the West Indies is very varied and very prolific, both the heat and the rainfall being great.

1. It includes forests of mahogany, logwood, etc; fibres, such as tobacco, cotton, and various kinds of agave; and coffee, cacao, sugar, etc.

N.B.—See under 'West Indies.'

Minerals.

1. North America is very rich in minerals, especially in coal and iron and in the 'precious metals,' mining industries succeeding agriculture where the new undisturbed strata of the prairie give place to the old disturbed rock of the mountains.

1. Gold and silver come next to coal and iron in importance because they supply the great standard of value and medium of exchange; and the United States are extremely rich in all the four minerals.

2. The country is naturally divided into three great mineral fields, corresponding to the three great mountain systems.

1. The Appalachian field, which stretches from the Gulf of St. Lawrence to Alabama, is specially rich in coal and iron; the Cordilleran field, which stretches from the Yukon to Mexico, is specially rich in gold and silver; and the Laurentian field, which is thoroughly explored as yet only round Lake Superior, is specially rich in iron and copper.

3. The coal is mainly confined to the United States and Canada, but in both countries it is found near to iron, to limestone (for 'flux' in smelting), and to navigable water. This greatly increases its value, and lowers its price.

1. The States produce *forty times* as much as Canada, though their coal area is only three times as large as the Canadian.
2. The Canadian fields are rich, well distributed, and conveniently situated; but the beds have been so much disturbed by mountain-building in past ages that they are very difficult to work.
3. Except in the anthracite districts, the U.S.A. seams are more or less uniformly horizontal, above water level, and very thick; and the total output is now much larger even than that of the United Kingdom.

4. The iron is found in each of the three great mineral fields.

1. The richest Laurentian deposits are in Michigan, where there is neither coal nor limestone; but this is more than compensated by the facilities for transport on the Great Lakes, Port Marquette being the chief centre.
2. The Appalachian field extends more or less from Nova Scotia to Alabama, but the most useful deposits are along the Ohio in West Virginia and along Northumberland Strait in Nova Scotia.
3. The Cordilleran deposits are most worked on and round Vancouver Island, where fuel and transport are very cheap.

N.B.—The U.S.A. output of iron-ore is one-third larger than that of Germany, and more than twice that of Britain.

5. Oil and gas are found mainly in the United States, though a little oil is found in Canada.

1. The U.S.A. oil comes mainly from the south shore of Lake Erie, *i.e.* the north-west of Pennsylvania, especially from

Bradford, and it is carried by pipes down both to the lake and to the Atlantic.

N.B.—Russia, the second great exporter in the world, exports little more than half as much as the States.

2. The Canadian oil comes mainly from the north shore of Lake Erie, *i.e.* the south-west of Ontario, especially from Petrolia.
3. The gas comes mainly from Pennsylvania, especially from round Pittsburgh, and is extremely useful in the iron and glass industries.

6. The Cordilleran system has hitherto almost monopolised the precious metals, and the output is so great that North America produces more gold than any other continent, and more silver than all the other continents together.

1. The gold is found mainly in California and Colorado, and in British Columbia and along the Yukon. The two former are hampered by want of wood and of water, but have the better climate and the advantage of quicksilver near at hand; the two latter are hampered by climate and difficulty of access, but have abundance of wood and of water.
2. The silver is found in very large quantities across the U.S.A. plateau from Nevada to Montana and Colorado, and in still larger quantities on the Mexican plateau. There are also very rich deposits in the West Kootenay district of British Columbia and the Cobalt district of Ontario.
3. The United States produce more gold than any other country, Russia coming second, and more quicksilver than all the rest of the world, Spain coming second. The Californian mines take their name of New Almaden from the old Spanish mines at Almaden. Cf. p. 110.

7. Copper is found both in the Cordilleran and in the Laurentian systems, and the output is greater than that of any other continent, Europe coming second.

1. The Cordilleran deposits are richest in Montana and Arizona, *i.e.* the east and west slopes of the Rockies; the Laurentian are richest in Michigan and Ontario, *i.e.* the south and north shores of Lake Superior.

N.B.—The United States produce more copper than any other country in the world.

8. The United States also produce more lead than any other country in the world, though Spain held the pre-eminence till quite recently.

The output comes mainly from Colorado, though several other Cordilleran States contribute largely.

N.B.—The amount and variety of minerals in the United States are accounted for by the size of the country and by the very varied age and character of the mountains. Cf. Spain, p. 110.

Fauna.

1. North America has not furnished any really valuable animal for the use of civilised man, but all the most useful animals have been domesticated in the country with complete success.

1. Amongst the native quadrupeds are the bison—wrongly called a buffalo—and the grizzly bear ; amongst the native birds are the turkey and the humming-bird ; and amongst the native fishes are the king-crab and the tarpon.

2. The most important fauna of the continent may be classified under three heads :—

1. The fur-bearing animals of the frozen north.
2. The food fishes of the east and west coast.
3. The sheep and cattle of the Great Central Plain.

3. The fur-bearing animals may be subdivided into :—

1. Seals from the Pribylov Islands and other parts of the Alaskan coast.
2. Big game, such as bear and elk, which are comparatively valueless.
3. The various small animals, such as marten, sable, silver fox, beaver, mink, skunk, which come mainly from the rough and otherwise valueless marshes to the east of the Mackenzie. St. Paul is the great fur market.

4. The fish may also be subdivided under three special heads :—

1. Sea fish, especially cod and herring, from the great Atlantic 'banks,' the cod coming mainly from the Newfoundland, and the herring from the New England banks.
 2. Salmon, especially from the cold, clear rivers of Washington and British Columbia, Astoria and New Westminster being the great centres.
 3. Oysters, mainly from Chesapeake Bay, where the Susquehanna and the Potomac provide the necessary percentage of fresh water and alluvial mud, and where the Delaware peninsula protects the beds from the violence of the Atlantic.
5. The sheep and cattle are found, literally in millions, on the eastward foot plains of the Rockies from Alberta to Guatemala.
1. The sheep come mainly from the higher or more mountainous parts, *e.g.* Montana and New Mexico.
 2. The cattle are relatively most important in Guatemala, but enormously most numerous in the United States; and almost all the Mexican cattle are sent into the States.
 3. Over almost the whole region the climate is magnificent, the grass rich, the water-supply sufficient, the price of land small, and transport convenient and very cheap.

Political Divisions.

1. British North America (cf. p. 46) includes the whole area from sea to sea north of the United States except Alaska and Greenland.

1. Alaska, which is more than four times as large as the United Kingdom, was bought by the United States from Russia in 1867. It is mainly the wild basin of the Lower Yukon, which is navigable for the whole of its U.S.A. course; and its main commercial value hitherto has come from the fur-seals that breed off its coast, though it is probably very rich in gold, and salmon are prodigiously abundant.
2. The capital is Sitka, to which the Russians travelled from the west, *i.e.* against the sun; and the Americans from the east, *i.e.* with the sun. Consequently, the Russian time is ahead of the American—so much so that the Russians keep their Sunday on the American Saturday.

3. Greenland, which is more than six times as large as the United Kingdom, contains the most northerly village in the world, Upernavik. Godhavn, the capital of the northern division of the island, is well within the Arctic circle ; and even Godthaab, the capital of the southern division, is not far outside it.

2. The United States, without Alaska, is only about thirty-four times as large as Great Britain ; but the 'territory' of Alaska is more than six times as large as Great Britain.

1. The largest State, Texas, is three times the size of Great Britain ; while the smallest, Rhode Island, is about the size of Cheshire or Dumfries. The 'district' of Columbia is, however, only half the size of Rutland, *i.e.* the size of Kinross.

3. Mexico is eight and a half times as large as Great Britain, and much the largest country of North America after Canada and the States.

1. Of the rest, Guatemala and Honduras are just half, and Nicaragua is rather more than half, the size of Great Britain ; British Honduras and Salvador are about the size of Wales, and Costa Rica is nearly three times as large as Wales.

4. The West Indies have a total area rather larger than Great Britain, of which Cuba alone constitutes nearly half.

1. They include, besides the islands mentioned on p. 47, the two Danish possessions of St. Croix and St. Thomas, and the Dutch possession of Curaçao.

DOMINION OF CANADA.

Surroundings and Harbours.

1. THE land boundary of Canada towards both Alaska and the United States proper—except for the Upper St. Lawrence and the Great Lakes—is entirely artificial, and is marked in most places only by a line of iron posts.

1. This absence of a physical barrier is beneficial to commerce, especially by rail ; but it has caused some little political trouble.
2. It has also a very marked effect on the climate of the United States. Cf. p. 140.

2. The Canadian harbours fall naturally into three groups : the Atlantic group, which includes both river and ocean ports ; the Pacific group, which have a great future before them ; and the Lake group, which will increase in importance as the various canals are deepened so as to admit larger vessels to and from the Atlantic.

1. Owing to the climate, the Arctic Coast is practically useless.
2. The Atlantic Coast is the most useful at present, because it has been the longest settled, it has unique facilities for communication inland, it looks towards the European markets, and its fisheries have very great political importance ; but it has great climatic disadvantages. Cf. p. 140.
3. The Pacific Coast is really the best, and will become more and more important, especially in connection with the development of its own mineral wealth and of the manufactures of Japan.

3. The Atlantic group has important harbours, both on the open ocean and on river estuaries.

1. The chief ocean harbours are Halifax and St. John; the chief river harbours are Montreal and Quebec. All the river harbours are more or less ice-bound for four or five months every year, and Port Nelson is even worse; but, thanks to the Gulf Stream, Halifax and St. John are never frozen.
2. Halifax—though its population is scarcely more than 40,000—has almost all the essentials to a successful harbour. It is large and deep, with excellent anchorage and its entrance protected by M'Nab Island; it is easily accessible from the ocean by the largest vessels afloat, in any weather and at any state of the tide; it has direct communication inland, being the terminus of the Inter-Colonial Railway; it is within easy reach—by water—of the Sydney and Pictou coal-fields; it is strongly fortified, though—like Esquimalt—it is now garrisoned by Canadian troops; the richness of the land and the denseness of the population behind it guarantee return cargoes without much delay or difficulty; no charge is made for dockage, and there are great facilities for repairing vessels. Cf. p. 11.
3. St. John, which is exactly the same size as Halifax, is much farther from coal, and is an inferior harbour, being specially troubled by the tide. The funnel shape of the Bay of Fundy, its smooth volcanic floor, and the pressure of the Gulf Stream, cause the tide to rise higher and faster than anywhere else in the world.
4. Port Nelson lacks almost every climatic and commercial advantage except nearness to Europe, but the latter advantage must make it become important. Cf. p. 129.
5. Montreal, which is as large as Hull, is much the most important of the river harbours, but it is handicapped by the climate. Cf. p. 140.

It is on an island, at the head of navigation for large ocean steamers; and it is the eastern terminus of the St. Lawrence canal system, the southern terminus of the Ottawa canal system, and the northern terminus of the Champlain canal system.

It stands at the most easterly point at which the St. Lawrence is bridged; it is the terminus of the Inter-Colonial Railway, and the junction between it and the Canadian Pacific and the Grand Trunk Railways.

It is the natural outlet for Ontario, the most populous and important of all the provinces; it exports enormous

quantities of grain, flour, cattle, and cheese, from or through Ontario, and timber from the Ottawa.

As the great transport centre of a country rich in iron, it has developed the largest iron and steel industry in the Dominion; but it has no coal. Cf. p. 163.

6. Quebec is much more important than the little island harbour of Charlottetown (cf. p. 166), but it has entirely lost its old pre-eminence, mainly owing to the deepening of the river up to Montreal.

It is just the same size as Greenock, which has been supplanted by Glasgow for a similar reason (cf. Havre and Rouen); it is the centre of a large lumber and pasture district, and the combination of pasture with forests of hemlock spruce has given rise to one of the largest leather industries in North America; and it was the scene of Cartier's welcome by the Indian chief, Donnacona, in 1534, and of the heroic deaths of Wolfe and Montcalm in 1759.

4. There are seven important Lake ports, all of which are in Ontario,—three of them on Lake Ontario, *i.e.* within easy reach of the Pennsylvanian coal-fields.

1. Toronto, which is about the size of Portsmouth, is the centre of the densest population, and has thus become a great railway junction and the chief university of Canada. Its position on the lake gives it such a good climate—in the latitude of Mentone—and the soil is so fertile, that it is also a great agricultural centre.
2. Hamilton, which is about the size of Oxford or Bath, has similar climatic and agricultural advantages, the soil being specially suited to fruit-growing; it is also the junction of the north and south 'shore' railways, and commands the Welland Canal round Niagara.
3. Kingston is to the east end of Lake Ontario what Hamilton is to the west end; it is the first point at which the Grand Trunk Railway touches the lake, it commands the Rideau Canal to the important political centre of Ottawa, and it is in enchanting scenery.
4. Port Arthur and Fort William, on Thunder Bay, command the Winnipeg grain trade from the north-west corner of Lake Superior; Port Sarnia and Owen Sound command respectively the trade from S.W. and N.W. across Lake Huron.

5. The Pacific coast has three important harbours—New Westminster, Vancouver, and Esquimalt.

1. There are innumerable inlets which, humanly speaking, are certain some day to be harbours of world-wide reputation, *e.g.* Port Simpson (the probable terminus of the new railways), though many of the fiords are too deep for anchorage.
2. Of the two mainland ports, Vancouver is better than New Westminster, Burrard Inlet being a larger, deeper, and safer harbour than the mouth of the Fraser; and Vancouver has, therefore, been made the terminus of the Canadian Pacific Railway. Cf. p. 159.
3. The island harbour of Esquimalt, the port of Victoria, is one of the great natural harbours of the world. It is within easy reach, by rail and by water, of the Comox and Nanaimo coal-fields; its sea-approach up the Juan de Fuca Strait is wide, deep, and direct; the Olympian Mountains shelter it from the south-west gales, and help to give it a beautiful climate; it practically commands the whole coal-trade of the west coast as far as San Francisco, the salmon and gold trades of the British Columbian Rivers, and the fur trade of the Alaskan islands.

6. The Canadian fisheries are extremely important both commercially and politically, the chief products being cod, herring, lobster, and salmon.

1. The market value of the fish amounts to more than £4,000,000, but that does not at all represent the importance of the industry. The cod fishery alone employs more than 50,000 men, who would form an invaluable Marine Reserve in times of national danger.
2. The cod, herring, and lobster come from the east coast, where both ice and access to markets are more easily obtained. The chief centre is Lunenburg, which, like the neighbouring harbour of Halifax, is never frozen, and which is conveniently situated for the despatch of the fish to the important 'Romanist' markets in the West Indies and Brazil.
3. The salmon are mainly confined to the tidal rivers of the west coast, *e.g.* the Fraser and the Skeena, where the fiords are very sheltered. The chief centre is New Westminster. The west-coast halibut-fishery is also very important.

N.B.—There is a considerable trade in white fish from the Great Lakes and Lake Winnipeg.

Surface and Climate.

1. Canada, like the United States, is naturally divided into three areas :

1. A high mountain system in the west,
2. A low mountain system in the east,
3. A huge low plain in the centre.

2. The western mountain system, besides being very high, is very long, very broad, and very near the sea; it runs from north-west to south-east, and has some deep depressions across it.

1. Thus, it meets the wet winds at their wettest, it condenses their moisture very suddenly and very completely, and it can store the moisture in huge glaciers.
2. A large proportion of the rainfall drains away *eastward* through the depressions across the range, thus giving Canada the most useful system of inland navigation in the world; and the glacier reservoirs guarantee the supply of water even through the driest summer.
3. Through the same depressions the warm south-west winds—completely dried by the precipitation of their moisture—can pass on over the prairie, where, as the ‘Chinook winds,’ they have a very marked effect on the climate.
4. Under the shelter afforded by the Rockies from the cold dry north winds, the warm wet Anti-Trades make the climate of the west very mild, and encourage a magnificent forest growth.

3. Central Canada is an enormous plain of very low elevation, separating the forest region of the Atlantic seaboard from the mineral wealth of the Rockies.

1. It slopes down very gradually from the south, *i.e.* the U.S.A. boundary, to the Frozen North, and has absolutely no protection from the Arctic winds.
2. It has also three ‘steps’ down from the Rockies to the centre—the Alberta step, the Assiniboine, and the Manitoban,—

the temperature varying with the level and the distance from the mountains.

3. The soil is rich almost everywhere except in the Frozen North (cf. p. 144), the level affords every facility for cultivation and transport, and the climate is very healthy for man and beast, the intense frost being also very useful for cleansing and pulverising the soil.
4. The low mountain system in the east is the water-parting between the Hudson Bay and the St. Lawrence, and its position gives it a very heavy snowfall.
 1. This makes it a great forest region. Cf. p. 146.
 2. The cleared land is most suited to pasture.
 3. The narrowness of the area from north to south, compared with its length, makes the St. Lawrence valley very important for both land and water transport. Cf. p. 113.
5. The chief rivers are the St. Lawrence, Saskatchewan, Mackenzie, and Fraser. Cf. p. 137.
 1. The Mackenzie, like the great Siberian rivers, flows from a warmer into a colder climate, which is fatal to its commercial prosperity.
 2. The Fraser descends so precipitately from the Rockies that it is practically useless for navigation, though it can be navigated by moderate-sized vessels for 100 miles—up to the Yale rapids; but it teems with fish, its lower valley has been very useful in connection with the construction of the Canadian Pacific Railway, and its pace and volume will make it of great value for mechanical purposes.
 3. As most of the rivers jump down the edge of the Laurentian plateau, they develop water-power at the falls, and often have long stretches of navigation (for canoes or light boats) between the falls.
6. The general level of the country and the depressions across the Rockies are most favourable to transport both by river and by rail.
 1. Montreal is the centre of a network of railways in the populous east; and Winnipeg is the 'pivot' of the great Canadian Pacific* Railway system, which is one of the

* Generally known as the C.P.R.

most important railways, both politically and commercially, on the face of the earth.

It gives uninterrupted communication for trade or troops on British territory from the Atlantic to the Pacific, and is much the shortest route to Australasia, China, and Japan; it has rich coal-fields and magnificent harbours at each end; in time of war, *e.g.* with France or Russia, it would be a much safer route to India than the Suez route, and much shorter than the Cape route.

Vegetation.

1. The vegetation varies, of course, with the soil and the climate; but the four great commercial products are timber, pasture, grain, and fruit.

2. Timber has been till recently the most important of all the Canadian exports, and the best comes from the rainy west and from the snowy east.

1. The eastern region extends from Lake Superior to Hudson Bay, and from Lake Winnipeg to the east of New Brunswick; the western region is practically the islands and coastal district of British Columbia.

N.B.—The 'lumber' trade owed its development to the fact that the supplies of timber from the Baltic to Great Britain were cut off during the Napoleonic wars.

3. The largest export is from New Brunswick, Quebec, and Vancouver Island.

1. Forests cover the north and north-east of New Brunswick, especially the basin of the Restigouche. The species of trees include spruce, cedar, and maple, the latter giving sugar as well as beautiful wood.
2. The combination of hemlock-spruce forests and pasture round Fredericton has given rise to a large leather industry; and half the capital of the whole province is said to be invested in saw-mills at St. John.
3. Forests also cover almost the whole of Quebec from the Ottawa to the Saguenay, and the rivers are extremely useful both for floating the 'logs' and for driving the saw-mills. The species include red and white pine, spruce, and birch. The Ottawa brings down the pine, mainly from

Lake Temiscaming, while the Saguenay brings down the birch, mainly from Lake St. John.

4. The combination of hemlock-spruce and pasture has given the city of Quebec a very large leather trade ; and Ottawa has the largest saw-mills in North America, the mill-hands going up country 'log-cutting' when the river is frozen.
5. The western forests consist mainly of fir, cypress, and cedar. The Vancouver Island forests are the most productive and the most conveniently situated for export, but the great saw-mill centre is on the mainland at Vancouver.
4. Lumber in value stands now below the various pastoral products, including cattle, cheese, and hay ; and they come mainly from the maritime provinces and from the eastern slopes of the Rockies.
1. Of the maritime provinces, Nova Scotia has the mildest climate and most facilities for export ; Prince Edward Island produces very good grass, partly owing to the valuable deposits of 'mussel-mud' manure found off the shore ; New Brunswick has dyked lands along the Bay of Fundy, which produce rich crops of grass under the natural manure of the sea-floods. ●
2. Ontario, which in climate is really a 'maritime' province, is the largest exporter of cheese in the world ; its soil is splendidly watered, and carries heavy crops of roots ; and the climate is eminently suited to cheese-making.
3. In Alberta the number of streams, the slope of the land, and the climate, are all extremely favourable to cattle-pasturing, especially round Calgary. In the east of Canada the snowfall necessitates the housing and artificial feeding of the cattle in winter ; but the Chinook winds greatly modify the climate of Alberta, and the district is too dry to have a heavy snowfall.
4. The dryness converts some of the natural grasses, *e.g.* the 'Buffalo' and the 'Bunch' grasses, into hay while they still remain uncut. Consequently, the cattle can generally feed over the ordinary pastures in winter, thus getting exercise in the fresh air and requiring little or no housing or house-feeding.
5. The grain is mainly wheat and barley.

1. The wheat comes from the magnificent prairies west of Winnipeg, especially from Assiniboia and Manitoba, the

richest returns being gathered in the Qu'Appelle and the Red River valleys, with their valuable summer rains.

2. The barley comes almost entirely from Ontario, and used to go across the Great Lakes to Philadelphia for the very extensive brewing industry ; but it is now fed to stock, as the U.S.A. tariff has killed the export. Cf. p. 174.
3. Oats are also grown, especially in Ontario and Prince Edward Island, where, like the hay, they are very useful in the breeding of horses for the United States.
6. The great fruit areas are Nova Scotia, Ontario, and British Columbia.

1. Nova Scotia produces the finest apples in the world on the sandstone of Annapolis and Minas Basin—where the forest-clad hills keep off the fogs and storms from the north-east ; the late spring prevents excessive making of wood, and the short autumn prevents waste of sap, while the hard winter kills the usual parasites ; the dry climate is very favourable to the fruit both before and after picking ; land is cheap, and markets are near—in the great cities of the eastern States.
2. The Hamilton 'peninsula' of Ontario produces very fine peaches and grapes, as well as apples ; the low level, the almost marine climate, the latitude (that of Marseilles), and the friable shale of the soil, are all exceptionally favourable.
3. British Columbia produces pears that rival even those of California. The soil round New Westminster is exceedingly fertile, and the climate is so fine that even oranges will ripen in the open air ; but the special product is pears, and the salmon-tinning industry provides all the necessaries for a tinned fruit industry.

Cf. the oyster tinning industry of Chesapeake Bay in connection with the tinned-vegetable industry of Maryland.

Minerals.

1. Canada is rich in mineral wealth, but at present the various minerals are scarcely worked at all except where there are special facilities for commerce.

1. This is most true of coal and iron, and least true of gold.

2. There are three great coal areas—in Nova Scotia, British Columbia, and the North-West Territories.

1. The Nova Scotia coal is found both on the mainland and on Cape Breton Island, and in both places it is on or very close to navigable water. The island field is round Sydney, and is the nearest to Europe. The peninsula field is along Northumberland Strait, between Pictou and Springhill, and is the nearest to the Atlantic terminus of the trans-continental railway system; it is also side by side with pure limestone and very fine iron ore at New Glasgow, Truro, and Londonderry.
2. The British Columbia coal is also found both on the mainland and on islands, but only the island fields are on navigable water, the mainland centre being Kamloops. The Vancouver Island centres of Comox and Nanaimo are nearest to the Pacific terminus of the trans-continental railway, but the Queen Charlotte Islands have the best coal. The facilities for shipping the coal at Comox and Nanaimo are really magnificent, and the coal-field is just opposite a mountain of magnetic iron ore in the island of Texada.
3. The coal in the North-West Territories is generally of poor quality, but of enormous extent; much the best quality is found round Calgary, especially at Lethbridge, Banff, and Cochrane, *i.e.* just where the C.P.R. begins to climb the Rockies. There is a valuable oilfield at Edmonton.

3. The only important iron-works hitherto have been at New Glasgow, Truro, and Londonderry, where there are the greatest facilities for smelting and for transport, and at Montreal; but there are large deposits of ore in Ontario, Quebec, and British Columbia. Cf. p. 156.

1. The Ontario product is now being manufactured most successfully at Hamilton and Kingston, where coal can be easily imported across Lake Ontario.

N.B.—There are also valuable oil-wells in the neighbourhood, especially between Petrolia and London.

4. The precious metals are mainly confined to the Cordilleran area, though gold is worked along the

south coast of Nova Scotia, and both gold and silver are worked in Ontario along the shore of Lake Superior—the silver especially at Cobalt.

1. Most of the Cordilleran gold is found along the Fraser, Columbia, and Yukon rivers ; and the abundance of water and timber gives the British Columbian miners a great advantage over their rivals in almost every other part of the world, especially in West Australia.
2. The chief centres are the Cariboo district of the Fraser basin, the Kootenay district of the Columbia basin—where there are also rich silver mines,—and the Klondyke district of the Yukon basin. Rossland is the Columbia centre.
3. In summer the Klondyke fields can be reached by river steamer from St. Michael's, which is on the north mouth of the Yukon ; but in winter there is no communication at all, and even in spring and autumn the passes across the Rockies from Juneau are difficult and dangerous. Cf. p. 167.

5. Besides the deposits of gold, silver, and oil, the disturbed rocks of Ontario also contain rich deposits of copper and nickel.

1. The copper is found in Algoma, along the north shore of Lake Huron, and the branch line of the C.P.R. from Sudbury to Sault St. Mary runs through the district.
2. The nickel lies also along the same line of rail ; the deposit is the richest known in the world, and is of immense importance to a naval power like Great Britain.

6. Amongst the other minerals of Canada are gypsum and apatite—two compounds of lime which are valuable as manures—and asbestos.

1. The gypsum is exported chiefly from Windsor (N.S.), but there are also rich deposits along the Tobique River (N.B.) and on the 'isthmus' between Lake Ontario and Lake Huron.
2. The apatite is exported chiefly from the Hull district of the Ottawa basin, but the deposit runs on westward into Ontario as far as Perth and Kingston.
3. The asbestos, which was discovered accidentally during a forest fire, is in Quebec—near Thetford.

Towns.

1. Canada has only two towns with a population of over 100,000—Montreal and Toronto—but in a new country the importance of a place cannot be at all gauged by its population.

1. Montreal, the largest, is about the size of West Ham (267,000). Cf. p. 155.
2. Toronto, the second, is the size of Portsmouth (208,000). Cf. p. 156.
3. Quebec, which comes third, is no larger than Greenock or York, *i.e.* only one-third the size of Toronto. Cf. p. 156.

2. Five towns have a population of from 40,000 to 60,000.

1. Hamilton, the largest of the five over ten years ago, is about the size of Barrow. Cf. p. 156.
2. Ottawa, the largest now, is the size of Warrington or Hanley; it owes its importance mainly to its lumber trade (cf. p. 160), but partly to its being the political capital of the Dominion.
3. Winnipeg, which is the size of Crewe or Londonderry, has risen to very great importance in a very few years, owing to transport. It stands at the confluence of two navigable rivers, and at the junction of the C.P.R. main line with at least eight other lines, including two U.S.A. lines down the Red River Valley.

It is the meeting-point of east and west, forest and prairie; it commands the fur trade from the north and the grain trade from the south; in summer it has navigation up the Red River right into the United States, up the Assiniboine for more than 300 miles, and up the Saskatchewan to Edmonton,—a distance, including Lake Winnipeg, of 1500 miles.

4. Halifax and St. John are about the size of Carlisle or Enfield. Cf. p. 155.

3. Three other towns have more than 20,000 inhabitants—London, Vancouver, and Victoria.

1. London, the largest of the three, is the size of Scarborough or

Wakefield. It stands in the very centre of the fertile Ontario 'peninsula' where it enjoys a beautiful semi-marine climate, which is very favourable to fruit ; it is within easy reach of navigable water on three sides—at the junction of the two branches of the Thames River, and commanding the two great through-routes by rail from Toronto to Chicago. It is, therefore, a rising industrial and agricultural centre, its special industry being the refining of oil. Cf. p. 163.

2. Victoria, which owes its importance mainly to its magnificent harbour, is as large as Stafford or Taunton. Cf. p. 157.

4. Several other towns have between 10,000 and 20,000 inhabitants, of which Kingston and Charlottetown are the most important.

1. Kingston is the size of Margate or Waterford. Cf. p. 156.

2. Charlottetown, which is no larger than Kilkenny or Chelmsford, has a good harbour on the most sheltered coast of Prince Edward Island, looking towards the most densely peopled part of Nova Scotia ; and it is the natural centre for the railway system of the island.

3. Guelph and Brantford are twin agricultural towns in the fertile Ontario 'peninsula,' and they are about the size of Warwick or Forfar ; Hull is a mining and lumber centre of the same size on the banks of the Ottawa.

5. There are several quite small places, especially on the coast and in the mineral districts, which must eventually become very important ; but the only small towns of much importance at present are Fredericton, Regina, Rossland (cf. p. 164), Calgary, and Dawson.

1. Fredericton stands at the head of navigation for large steamers, which is also the lowest point at which the St. John is bridged ; it is the size of Selkirk or Killarney (5500), and is the political capital of New Brunswick. The district round is divided between pasture and hemlock-spruce forests, and this has given rise to a leather trade. Cf. p. 156.

2. Regina is an important station on the C.P.R., but is a tiny place like Wigtown or Oakham ; it is the meeting-point of the cattle ranches of the 'plains' and the grainfields of the 'prairies.' But Prince Albert, or even Battleford, is a better centre for Saskatchewan.

3. Calgary is a large village, and owes its importance to its position between the Alberta pastures and the valuable coal of the Bow valley,—by which the C.P.R. climbs the Rockies ; but Edmonton is the natural centre of Alberta.
4. Dawson City is the centre of the Klondyke goldfields, and stands at the confluence of the Klondyke and Yukon. It can be reached in three days by river-steamer from Lake Bennett (June to September) ; but there is a difference of opinion about the route to Lake Bennett, the best being probably that by the Lynn Canal *via* Skagway (U.S.A.), and the short White Pass railway. The 'all-Canadian' route, by the Stikine river *via* Telegraph Creek and the wagon-road to Lake Teslin, avoids the U.S.A. 'customs.'

N.B.—The sea journey from Victoria to Dyea *via* Juneau and the Lynn Canal is 100 miles longer than that to Telegraph Creek *via* Fort Wrangell and the Stikine River.

5. A fine climate, fertile soil, and the new Trans-Continental railways are making Edmonton a very important centre.

NEWFOUNDLAND.

1. THE colony of Newfoundland includes the island itself and the dreary coast of Labrador from the west end of Belle Isle Strait to Cape Chudleigh.

1. The colony has persistently refused to join the Dominion of Canada, and has treated the Canadian fishermen rather badly. It has also involved the British Government in serious political difficulties by its attitude to the French fishermen, who, by the Treaty of Utrecht, had certain fishing rights—now abandoned—off the coast. Cf. § 2 (2) below.

2. The island has about 2000 miles of coast ; and the two coasts that are exposed to the Atlantic waves and gales, are extremely broken.

1. Where these two coasts meet, the peninsula of Avalon has been almost severed from the mainland by the deep indentations of Placentia Bay and Trinity Bay—the latter being the great terminus of the Atlantic cables.

2. The whole coast-line is very rugged and fringed with islands, two of which—Miquelon and St. Pierre—belong to France ; and the French originally claimed *exclusive* shore rights from Cape Ray to Cape Bonavista *via* Belle Isle Strait—a distance of 450 miles on the most sheltered part of the coast. This was a grave injustice to Newfoundland.
3. Many of the bays would make fine harbours in summer, but the only harbour of any importance at present is St. John's.

N.B.—As these bays are the drowned valleys of the old Appalachian system, most of them run N.E. and S.W.

3. The value of the coast for fishing is very great, both round the island and along the 750 miles of Labrador that belong to Newfoundland.

1. One-third of the whole population (about 220,000) is engaged in the fishing industry, and the export of fish products is a dozen times as valuable as that of all the other products of the colony.
2. Of course, the cod fishery is much the most important. It is so largely confined to the Great Bank that the fishermen are known locally as 'Bankers.' The season lasts from June to the middle of November, and even the procuring of bait (capelin, squid, etc.) is so important that it has become a definite industry.

N.B.—The 'Bait Laws'—being almost the only defence of the Newfoundlanders—have been used most effectively against the French 'Bankers.'

3. The seal fishery comes next in importance, but is carried on solely for oil and skins, the seals not being of the fur-bearing kind ; the season is from the middle of November to June, and the hunting grounds are the ice-floes along the coast of Labrador.
4. Amongst the other fish products are lobsters, herring, and salmon. Lobster-canning, which is a rising industry, has been another cause of difficulty with the French ; the herring are most plentiful in Fortune Bay, and the salmon off the Gulf coast.

4. St. John's is the only harbour of any importance at present, and is both the political and the commercial capital of the colony.

1. It is so deep that the largest vessels can enter at any state of the tide, but the entrance is so narrow that only one vessel

can enter at a time ; it is less than 1700 miles from Ireland, and the peninsula of Avalon has the best climate in the colony ; and it is the headquarters both of the cod fishery and of the seal-hunting. It has thus a population as large as that of Perth or Lancaster.

5. The climate of the colony is very unpleasant, but not unhealthy.

1. Owing to the presence of sea on every side, the extremes, even in the portion of the country farthest from the influence of the Gulf Stream, are not nearly so great as in Canada, the thermometer seldom falling below zero ; but the meeting of the cold Labrador current with the warm Gulf Stream causes constant fogs.
2. The south-west Anti-Trades bring a heavy burden of rain off the Gulf Stream ; but, as the chief range of mountains—the Long Range—is in the extreme west, and does not present a full face to the south-west winds, the rainfall is less than it would otherwise be.

6. The surface of Newfoundland is rough and hilly, the hills rising to the height of Scaw Fell or Ben Lomond.

1. The area is nearly as large as that of England without Wales, but a considerable portion is still unexploited ; and, except on the Avalon peninsula, there is practically no settlement more than a mile or two from the coast.
2. With such a surface and such a climate, agriculture is impossible except in a few favoured places round the coast and along the lower valleys of the rivers ; indeed, fully one-third of the entire surface is covered with lakes and marshes.
3. Consequently, the population is extremely limited, being no more than that of the single town of Hull ; and the only place except St. John's that is more than a village is Harbour Grace, a little town about the size of Monmouth or Killarney.
4. A few thousand men are, however, employed in various mining industries. Copper is worked round Placentia Bay, and there are deposits of it also round Notre Dame Bay and of coal round St. George's Bay ; but both the latter are on the ' French shore,' where the Newfoundlanders till quite lately could not go. Cf. § 1 above.

5. The only other industry of any importance is lumbering. Timber, mainly pine, is found along most of the rivers, *e.g.* the Exploits and the Humber; and the amount of water-power is favourable to the development of the industry. Unfortunately, however, some of the best timber, like some of the best agricultural land, is found along the disputed western coast; and access to it from the land side has hitherto been practically impossible.

N.B.—Quite recently a railway has been constructed right across the island, and this will probably give a great impetus to the various land industries, *e.g.* working the Grand Lake coalfield.

THE BERMUDAS.

1. **THIS** group of islands is of coral formation; and, thanks to the Gulf Stream, it is in a higher latitude than any other similar group in the world.

1. The coral formation is so porous, and the islands are so small, that there are no fresh-water springs; and, therefore, the water supply for drinking purposes depends on rain.
2. The Gulf Stream gives the islands a wonderful climate; the variation of temperature is very slight from winter to summer, and frost is unknown.
3. There are about 360 islands altogether, but only about 20 are inhabited, and the population of them is only 16,000, mainly negroes; but their importance is very great. Their climate makes them a favourite winter resort for the Americans, and in spring the 'market-garden of New York'; and their position and their good harbours make them an important naval centre.

2. The two chief harbours are St. George and Hamilton.

1. St. George, the great naval station, has the advantage of being just inside the 'Narrows,' which is the best passage through the coral reef.
2. Hamilton, which is on the largest island, is the political and commercial capital, and is defended from the west by another naval station on Ireland Isle.

3. The chief products are vegetables, but fruit and timber are also important.

1. Arrowroot, formerly the staple product, is now quite unimportant ; and its place has been taken by onions, potatoes, and tomatoes. Fine lilies are also grown.
2. The most important fruits are melons and bananas, and the most important wood is the red 'cedar,'—for pencils.

UNITED STATES.

General Surroundings.

1. COMMERCIALLY, the Atlantic coast is at present the most important, owing to its natural facilities for foreign trade, and it has five great advantages.

1. It is twice as long as any other, which it owes mainly to its deep indentations ; it is the nearest to Europe ; it has very good communication inland, up the Hudson Valley and across the detached part of the Alleghany Mountains ; it has rich deposits of coal and iron just behind its best natural harbours ; and these harbours are free from ice the whole year round.
2. The Atlantic ports may be classified under two heads—the 'general' ports of the northern half, and the 'cotton' ports of the southern half. The former include New York, Boston, Philadelphia, Baltimore, Norfolk, and Portland ; and the latter include New Orleans, Savannah, Charleston, Galveston, and Mobile. The distinction is not exclusive, however ; for instance, New York exports cotton, and New Orleans exports general products.

2. The Lake and the Gulf coasts are the same size, which is exactly half that of the Atlantic coast.

1. The Lake coast is even more important than the Atlantic coast for home trade, and it has abundance of timber and of minerals, including coal and iron ; but it is ice-bound in winter.

2. The Gulf coast is low and sandy, and has no mineral wealth of its own ; but the natural slope of the Mississippi basin brings it an immense amount of trade both by river and by rail, the fertility of the region amply repays outlay on artificial harbours, and ice is unknown. It is also the most important of all the coasts climatically, as it supplies rain to half the country.

3. Owing to its simple, unbroken outline, the Pacific coast is only one-third the size of the Atlantic.

1. It has the most genial climate of all, but it is backed for a considerable distance by desert.

4. The land boundary both towards Canada and towards Mexico is partly natural and partly artificial.

1. The artificial boundary towards Canada is mainly the 49th degree of north latitude ; the natural boundary towards Mexico is the Rio Grande. Cf. p. 154.

N.B.—The absence of natural boundaries has important political, climatic, and commercial effects. Cf. p. 154.

Ports.

1. New York is the most important harbour in the New World.

1. It stands on Manhattan Island, with the Hudson River on the west and the so-called 'East River' arm of Long Island Sound on the east ; and Long Island itself protects the approach from the ocean.
2. It is practically free from ice, conveniently situated for European trade, and within easy reach of fuel and machinery.
3. It has splendid communication inland, mainly *via* the Hudson river and canal system. Indeed, the facilities for transport by rail and by water up the Hudson and the Mohawk valleys have attracted to New York a large proportion of the export trade even from the Far West. Cf. p. 135.
4. It is about equal to London in the matter of tonnage entering and clearing, and transacts nearly half the foreign trade of the country.
5. The population of the city itself is 1,500,000, *i.e.* twice that of Glasgow ; but, as its insular position has prevented its

natural expansion, it has spread a total population of 3,700,000 over its immediate neighbourhood, including the 'cross-water' suburbs of Brooklyn, Long Island City, and Jersey City. Its great local industry is clothing.

N.B.—Brooklyn is now formally incorporated in New York.

2. Boston, the mother city of New England and the most 'English' of all the U.S.A. cities, is rather larger than Birmingham.

1. It occupies a group of peninsulas on the tidal estuary of the Charles River, and has a perfectly safe and commodious harbour; but it is some distance from coal and iron.
 2. It inherits very famous literary and educational traditions, which have made it the great intellectual centre of the country; and it played a prominent part in the War of Independence.
 3. The great water-power and the vast forests of New England have led to a wide development of textile, leather, and paper industries, though the climate is not altogether suitable for textiles (cf. p. 14); and Boston imports large quantities of cotton, wool, and hides, for distribution to river-side towns like Lowell, Lawrence, and Haverhill, and collects their manufactures for export.
 4. It has also developed large clothing and book industries of its own; and its neighbour, Lynn, has developed a large boot and shoe industry. Of course, paper is even more important than leather in the book trade; and Holyoke, which stands on the Connecticut at the foot of the forest-clad Hoosac Mountains, makes more paper than any other town in America.
 5. As the chief harbour on the New England coast, Boston has attracted all the great western railways; and thus it has special facilities for distributing goods, *e.g.* the fish of Gloucester, the largest fishing-port in the country.
3. Philadelphia is nearly twice the size of Liverpool, with which it has a good deal in common.
1. It stands at the confluence of the Delaware and the Schuylkill, which is also the head of ocean navigation; but the amount of land round the estuary, and the exposure to the northern winds, sometimes cause it to be partially frozen in winter.
 2. Its importance is due, therefore, less to its harbour than to the field of magnificent anthracite coal which lies along the

Schuylkill, and which has made the city the greatest manufacturing and brewing centre in the New World. Cf. p. 162.

3. It has very good communication inland up the valley of the Susquehanna, which in its lower course breaks right across the Alleghanies; and this makes it the natural outlet eastward for the great coal, iron, and oil-fields of Pennsylvania.
4. Pennsylvania is one of the best sheep-raising districts in the country, and has large forests of hemlock-spruce in the north; and Philadelphia is also the natural outlet for the wool, skins, and tanning bark. This gave rise to the carpet and leather industries for which the city is now so famous.
5. The fine sheltered harbour, the abundance of coal and iron, and the nearness of good timber, have also made it the greatest shipbuilding centre in the country.

N.B.—It was the most southerly Atlantic port in the Anti-slave States.

4. Baltimore and Norfolk command opposite ends of Chesapeake Bay, to the west of which the soil and the climate are admirably suited to fruit and fibre, especially tobacco, and in which there are some of the finest oyster-beds in the world.

1. Baltimore, which is nearly as large as Boston, is the centre of the tinned fruit, vegetable, and oyster industries, and manufactures tobacco. It has easy communication inland *via* the Potomac and Susquehanna valleys, and was the most northerly Atlantic port in the Slave-holding States.
2. Norfolk, which is only a little town the size of Colchester or Londonderry (U.K), has, in the mouth of the James River, one of the finest natural harbours on the Atlantic coast, and commands part of the tobacco trade of the James and the Roanoke valleys.

5. Portland, the commercial capital of the 'Pine Tree State' of Maine, is just the same size as Norfolk, but it has a very different trade.

1. It has such a fine harbour, and is so free from ice, that it is the natural winter port for the St. Lawrence; and thus it has been made the terminus of the Grand Trunk Railway of Canada.
2. Maine has a huge lumber trade; and, as the trees are mainly conifers, especially spruce, and as the water is very soft and pure, there are exceptional facilities for pulp and paper works.

3. Portland is the nearest of the U.S.A. harbours to Europe, and has just behind it—on the Androscoggin River—the best water-power in the State for these works. It has also a leather industry.

N.B.—The Androscoggin also drives the great cotton mills of Lewiston.

6. Of the five 'cotton' ports, New Orleans is much the largest, being nearly the size of Bristol.

1. Like Bristol, it is really a river port, and the approach has been made possible for ocean vessels only after very expensive dredging.
2. It is the most central port on the Gulf coast, and is, like Bristol, a very old town; it has, therefore, come to control a number of trades besides the cotton, especially the sugar and rice of Louisiana.
3. It is, however, a long way from coal and iron, and its low level and swampy surroundings make it very unhealthy.

7. Of the other 'cotton' ports, the two on the Gulf have the best natural harbours, but the two on the Atlantic are the most important.

1. Charleston, which has a population just over 56,000, stands where the confluence of the Ashley and the Cooper gives a volume of water which made it possible to construct a good artificial harbour seven miles from the ocean, in the very centre of the South Carolina coast.

The water-power from the 'Piedmont' slopes behind it is very great, and very useful both to lumbering and to cotton manufacture; the climate is suitable to the raising of early fruits and vegetables, and there are rich deposits of phosphates along the Ashley.

Its special export, however,—in which the neighbouring harbour of Wilmington shares—is of rosin and turpentine from the yellow-pine forests of the Carolina coastal plain. It also exports excellent rice.

2. Savannah, which in 1903 was a little larger than Charleston, stands on the tidal estuary of the Savannah, protected from the Atlantic by a line of flat 'sea-islands,' which produce the best cotton in the world; and the falls of the Savannah have made the inland centre of Augusta the chief manufacturing city of the southern States. Savannah also exports 'Carolina' rice.

3. Mobile, which is about the size of Perth or Lancaster, stands on the fine estuary of the Alabama; and thus it has navigation right through the lumber district of south Alabama very nearly up to the Birmingham coal and iron field, as well as direct communication by rail with both the centre and the south of Mississippi, a great cotton-growing State.
4. Galveston, which is nearly the size of Mobile, is the only good harbour in Texas, the largest State in the Union; it is the natural port for the great railway centre of Dallas; it collects excellent cotton from along the coast, and has access by the Southern Pacific Railway to the finest cattle ranches of the Far West. As both a cotton and a cattle centre, it has special advantages for manufacturing oil-cake.

Ports (2).

1. The Inland ports are numerous and extremely important, and almost all of them are on the Great Lakes.

1. By far the most important are Chicago, St. Louis, and Buffalo; but five others have a large trade—Cleveland, Detroit, Milwaukee, Toledo, and Duluth.
2. Chicago is one of the most extraordinary cities in the world, "the epitome and climax of lake and prairie."

1. In 1830 it was a hamlet of 70 souls living in 12 cottages; when it had grown to more than 25,000 houses, it was burnt to the ground—in 1871; and to-day it is a huge metropolis three times as large as Manchester, and covering an area as large as the whole county of Renfrew. In sixty years it multiplied itself 20,000 times!
2. It is one of the most perfectly equipped ports in the world, and has been deepened to admit vessels carrying up to 5000 tons of cargo. More vessels enter and clear every year than at London and New York combined! And by the Illinois river and canal system it has direct water communication with St. Louis, *i.e.* with the Gulf of Mexico, through the richest maize area of the country.

N.B.—Maize is specially used in fattening pigs—called in U.S.A. 'hogs.'

3. All the trans-continental railways of the north must converge on it to get round Lake Michigan, and the level expanse of prairie gives every facility for railway construction.
4. It has the rich coal-fields of Indiana and Illinois behind it, and is within easy reach by water of the iron, copper and timber of Michigan.
5. It is the greatest railway centre, the greatest grain market, the greatest pork market, and one of the greatest lumber- and cattle markets in the New World.
6. The presence of such a huge population in the centre of a timber area has given rise to an enormous furniture industry, and the demand for railway stock and agricultural implements is at least equally great. Naturally, too, in a cattle and timber market, there is an important leather industry.
7. As a great railway junction so near the Michigan ore, it has also developed very large iron and steel works—specialising in rails and locomotives.

3. St. Louis, though only about one-third the size of Chicago, has a position of great importance, and its trade resembles that of Chicago.

1. It is the mathematical centre of a huge area of very rich country, being half-way between the Rockies and the Atlantic and half-way between Lake Superior and the Gulf of Mexico. This gives it exceptional advantages for collecting and distributing goods.
2. The level of the land, and the fact that for many years St. Louis was the lowest point at which the Mississippi was bridged, made it a great railway centre; and these southern railways are never blocked by snow. Being just below the confluence of the Missouri and the Mississippi, it has also special advantages for river shipping.
3. With a rich grain area to the north-west and a rich tobacco area to the south-east, it specialises in flour-milling and manufacturing tobacco.

4. Buffalo is not nearly as large as St. Louis, being at present no larger than Belfast; but it is growing very rapidly.

1. It is the most easterly port on Lake Erie, and the western terminus of the Erie Canal; and thus it commands the whole trade along the canal between the Great Lakes and New York.

2. It stands on the edge of the Pennsylvanian coal and iron field, and is only 22 miles from the enormous water power of Niagara—from which the street cars and the mills are already being worked.
 3. It commands the cross trade between the densely peopled areas of Ontario and New York State, and the railway traffic along the south bank of the St. Lawrence.
5. Of the other five Lake ports, Cleveland, Detroit, and Milwaukee are much the largest.
1. Cleveland, which exceeds Buffalo in population, has such a good harbour that it has attracted practically all the lake trade of eastern Ohio in coal, iron, and oil.
 2. Detroit, which is rather larger than Bradford (280,000), commands the 'through' lake traffic and the 'north shore' railway traffic between Chicago and Ontario *via* the St. Clair tunnel. Its importance as a railway junction, and its easy access to the Michigan iron and timber, account for the large manufacture of railway stock.
 3. Milwaukee, which is the same size as Detroit, has direct water communication from the Mississippi; it commands the lumber, grain, cattle, and hop trades of southern Wisconsin; and, in connection with the grain and hops, it has an immense brewing industry.
 4. Toledo, which is about the size of Oldham or Sunderland, stands where the main line from Buffalo and Cleveland to Chicago and the West crosses the navigable estuary of the Maumee River; it has an oil industry of its own, and is the natural outlet eastward for the grain and lumber of northern Indiana.
 5. Duluth is at present no larger than Dover or Londonderry, but it has been growing very rapidly; it is the farthest inland of all the ports, and thus has been made the terminus of the Northern Pacific Railway (N.P.R.); it commands all the wheat and iron trade of central Minnesota, and a great deal of the through traffic along the N.P.R.
6. The Pacific has only three commercial centres—the Golden Gate, the estuary of the Columbia, and Puget Sound.
1. San Francisco occupies a peninsula on the south, *i.e.* the sheltered, side of the Golden Gate, where it has a delightful

climate—though liable to terrible earthquakes—and every facility for commerce except coal. All the railways from north, east, and south must converge on the Golden Gate to reach the Pacific.

The harbour has immense wealth behind it in wheat, fruit and wool, and to a less degree in precious metals; it monopolises the growing U.S.A. trade with China and Japan, and has a distinct 'Chinese quarter.' Its population in 1903 was rather larger than that of Bristol.

2. Puget Sound is one of the finest natural harbours in the world. Seattle, which is now as large as Swansea (98,000), controls the vast fishing industries of the Sound, the wheat trade from the clay lands of eastern Washington, and the general trade eastward.

Tacoma, which is as large as Colchester or Londonderry, controls the timber trade from the rainy hills of western Washington.

3. Portland, which is rather larger than Seattle, stands at the confluence of the Columbia and the Willamette, where it is the eastern terminus of ocean navigation and the western terminus of the N.P.R.

It controls the wheat trade down the Columbia valley from eastern Oregon, the through trade down the Willamette valley from San Francisco, and the timber trade of the Cascade Mountains, as well as the salmon and shipping industries of the Columbia.

The chief canning centre is Astoria, the nearest port to the tin mines of the Malay Peninsula.

Surface and Vegetation.

1. The 'relief' of the United States is essentially typical of North America—a huge low plain shut in by a low mountain system on the east, and by a high and massive mountain system on the west (cf. p. 158); but it has a few important variations from the 'relief' of Canada.

1. The general slope of the plain is from north to south, not from south to north; this has the advantage of being from a colder to a warmer latitude, and it naturally takes both river and rail traffic to the Gulf coast.

2. As the country is entirely within really temperate latitudes, extremes of climate must be due to other causes than latitude.
3. It has its chief plateau system in the west, not the east, which indirectly causes the chief water-parting to be deficient in glaciers ; and, therefore, the rivers vary greatly in volume.

2. The vegetation, of course, varies with the soil and the climate ; but the five great commercial products are grain, pasture, fibres, fruit, and timber.

1. The grain and pasture come mainly from the Mississippi basin.
2. The fibres and fruit come mainly from the eastern coast-lands.
3. The deep valleys of the Pacific coast also produce very fine grain and fruit.

3. The grain varies, with the soil and the climate, from rye to rice ; but wheat and maize are much the most important—the maize being the more abundant, but the wheat the more important for export.

1. The volcanic plateau of Oregon and Washington and the alluvial plain of Minnesota produce the best wheat, but the largest amount comes from Dakota, Ohio, and Indiana.

Duluth and Milwaukee are the natural outlets for the Minnesota and Dakota grain, and Chicago and Toledo for that of Indiana and Ohio ; but a very large quantity goes by rail to New York, even from Dakota—to save trans-shipment. Cf. p. 172.

2. Maize, the only indigenous grain of the New World, and the most important for the U.S.A. home market, requires more heat and more moisture than wheat ; and, therefore, it is grown mainly on river 'bottoms' south of the wheat area.

The most productive areas are the south of Iowa between the Missouri and the Mississippi, the 'peninsula' of Illinois between the Ohio and the Mississippi, and the whole State of Missouri, in which the three rivers meet ; but it is also grown in the 'peninsula' of Nebraska and Kansas that is shut in by the Platte, the Missouri, and the Arkansas.

It is convenient access to these enormous stocks of maize that has made Chicago and Cincinnati the two largest 'hog' markets in the world. Cf. pp. 176 and 185.

3. Oats for horses and barley for brewing are largely grown in the densely-peopled States along the Great Lakes; very fine barley is also grown in California, and rice is grown in the Louisiana swamp, though it is gradually being displaced by sugar cane.

N.B.—The two barley districts also grow large quantities of very excellent hops, of which there is even an export to England.

4. The great pasture area is the tract of rolling grass-lands west of the Mississippi, which stretch from Iowa to Texas and from New Mexico to Missouri. It already supports 40,000,000 cattle, and could support twice as many.

1. A large number of cattle are also raised round Lake Michigan—in Ohio, Indiana, Illinois, and Wisconsin.
2. Besides these cattle, a very large number of sheep are raised in the more mountainous States farther west, from Montana to New Mexico and from Wyoming to Oregon; and the finest wool on the continent comes from the Oregon and Californian sheep-farms.
3. The great local markets are Kansas City, Dallas, and Omaha, which sprang into importance as soon as railways from the east reached them.

5. The chief fibres are cotton, tobacco, and flax.

1. The flax, which is the hardiest and the least important, comes mainly from Minnesota.
2. The cotton, which is the least hardy and the most important, comes mainly from Texas, Georgia, Mississippi, Alabama, and South Carolina. Cf. p. 147.
3. The tobacco comes mainly from Kentucky, Virginia, and their southward neighbours, Tennessee and North Carolina.

6. The chief fruits are apples, oranges, and grapes.

1. The best apples come from New York, Delaware, and Pennsylvania. Cf. p. 147.
2. The oranges come almost entirely from Florida.

3. The best grapes come from California, where they are converted largely into wine, raisins, and brandy.

N.B.—California also grows splendid pears and prunes, and Delaware grows peaches. Cf. Michigan and Maryland.

7. The timber comes mainly from the north-east and north-west corners of the country, where there is the heaviest fall of rain and snow; but large quantities come from the Michigan and Florida peninsulas, which naturally have a very moist atmosphere. Cf. p. 146.

1. The chief timber States are Maine, Michigan, and Washington.
2. The chief timber centres are Saginaw and Bay City, both on the Michigan peninsula.
3. Florida produces the so-called 'cedar' or juniper, which is shipped from Pensacola and Jacksonville to the various pencil-making centres of Europe.

Minerals.

1. The mineral wealth is very great and well distributed, and includes all the most useful minerals except tin. Cf. p. 148.

1. The country produces more gold, more copper, and more quicksilver than any other country in the world.
2. Roughly, it may be said, fuels are produced in the east, precious metals in the west, and the ordinary commercial metals in the middle.
3. Some deposits of tin are said to have been discovered lately along the Colorado River in Texas.

2. There are two fields of real coal, the Alleghany and the Central, of which the former is much the larger and the more valuable.

1. The Alleghany coals are of three kinds: anthracite to the east of the mountains, bituminous to the west, and semi-bituminous between the other two.
2. The anthracite lies along the banks of three rivers: along the Susquehanna between Scranton and Wilkesbarre, along the Lehigh round Manch Chunk, and along the Schuylkill

round Pottsville ; and, as both the Lehigh and the Schuylkill are tributaries of the Delaware, the coal has easy access to Philadelphia. Cf. p. 174.

3. The semi-bituminous coal is most abundant along the Potomac at Cumberland, but the field is not a large one.
4. The bituminous coal is found along the whole length of the western slope of the Alleghany Mountains, from Pittsburg to Birmingham, and is everywhere on or quite near to navigable water. The richest deposits are along the Ohio and the Monongahela, especially round Pittsburg, Wheeling, and Connellsville ; but the Alabama deposits are proving much richer than was expected.
5. The central field is much smaller and less valuable, but is very useful to Chicago and St. Louis. Its centre is at Terre Haute, where the railway from Indianapolis to St. Louis crosses the Wabash River.

3. Besides this large supply of coal, there are also most valuable supplies of oil and natural gas, both of which are so clean and so cheap that they are taking the place of coal, especially in iron and glass works, throughout the entire west of Pennsylvania and a large proportion of Ohio.

1. The gas is most abundant round Pittsburg ; the oil, which is of an exceedingly good quality, is most abundant in the valley of the Alleghany River and along Lake Erie, especially round Bradford, Cleveland, and Oil City. It is conveyed in pipes for hundreds of miles, *e.g.* to Philadelphia.

4. There is abundance of good iron ore in both the great coal areas, but the richest deposits are along Lake Superior.

1. The chief Michigan centre is Port Marquette. Cf. p. 149.
2. The Alleghany centres are along the Ohio between Ironton and Marietta, and in the upper basin of the Alabama round Birmingham.
3. As almost the whole Alleghany region is rich in good limestone, 'flux' can be got easily everywhere.

5. The precious metals come almost entirely from the Cordilleran system.

1. The gold output was valued in 1904 at £16,000,000. Colorado and California produced respectively nearly £5,000,000 and £4,000,000, and Montana, South Dakota, Idaho, and Arizona produced another £3,500,000 between them. By far the richest mines are at Cripple Creek, in the Pueblan corner of Colorado.
2. The silver output was valued in 1904 at £14,000,000; the chief producers were Colorado and Montana, and the special centres in each were Leadville and Butte City.

N.B.—Leadville, as its name implies, produces lead as well as silver; and Butte City practically shares with the Calumet district of Michigan the huge copper trade of the States.

Towns and Industries.

1. As in Canada, the importance of the towns cannot always be fairly gauged from their population.

1. Very important sites have not yet become populous, and the export of raw materials is more important in most places than domestic manufactures. Consequently, the coasts are relatively more important at present than the coal-fields, and harbours have matured more quickly than manufacturing centres.

2. The last census showed that there were 70 towns with a population of over 50,000.

1. Of these, 39 had a population of more than 100,000, *i.e.* were larger than Southampton or Cork; and of the 39, 19 had more than 200,000, *i.e.* were larger than Portsmouth or Leicester.
2. Of the 19, 6 had more than 500,000, *i.e.* were distinctly larger than Leeds; and of the 6, 3 had more than 1,350,000, *i.e.* were at least three times the size of Leeds.
3. The growth of population in many places since the previous census (1890) has been very rapid; for instance, Chicago has risen from 1,100,000 to 1,900,000, and Kansas City from 132,000 to 174,000.

3. Of the 19 cities that have more than 200,000 inhabitants, as many as 14 are harbours. Cf. p. 172.

1. New York (cf. p. 173) is larger than Chicago (1,900,000) and Philadelphia (1,400,000) put together.

2. Brooklyn, the chief suburb of New York, is by itself more than twice the size of Leeds.

N.B.—Of the other suburbs, Newark is as large as Nottingham, and Jersey City is as large as Leicester.

3. St. Louis and Boston are considerably larger, and Baltimore is rather smaller than Birmingham.
4. Cleveland, Buffalo, and San Francisco are all larger than Dublin or Bristol.
5. Milwaukee, Detroit, and New Orleans are rather larger than West Ham or Bristol.
6. Newark and Jersey City (respectively 265,000 and 220,000) have nearly all the advantages of New York, and the additional advantage of being on the landward side of the harbour, and thus having direct rail inland. Jersey City is the terminus of the great trans-continental lines; and both places manufacture luxuries for New York, especially jewelry and patent leather.

N.B.—Contrast the comparative insignificance of the political capitals of most of the States, though their central positions may eventually make them important railway junctions.

4. The five cities which are not recognised harbours are Cincinnati and Pittsburg (about 340,000), Washington (293,000), Louisville and Minneapolis (215,000); and all five are actually on navigable water.

1. Cincinnati stands on the north bank of the Ohio, at the north-east corner of the great maize area of the Mississippi basin. This position made it an important place in the days when the Ohio separated the 'slave' States of the south from the 'free' States of the north, and in later times made it a natural food centre for the mining area of the upper Ohio—the speciality in a maize and oak district being naturally pork. Cf. p. 181.

N.B.—The great northward sweep of the Ohio facilitated the construction of the Miami canal from Cincinnati to Lake Erie.

2. Pittsburg stands at the confluence of two navigable rivers in the centre of a coal, iron, oil, gas, and limestone district; and thus it has become a very important industrial centre, with the largest iron, steel, and glass industries in America—excellent glass-sand being found in the upper valley of the Ohio, and the gas-fuel producing glass of special transparency. Pittsburg itself is now largely a warehouse

centre, the actual industries being carried on in the 'suburbs'—Allegheny, Birmingham, Manchester, etc.

3. Washington, on the contrary, has entirely neglected its geographical and commercial advantages, and owes its population to its political importance as the capital of the Republic. It is a beautiful city on the broad Potomac River, exactly 77° west of Greenwich. The 'Capitol,' in which Congress meets, is one of the finest buildings of its kind in the world; and, as the principal streets have an average width of about 150 feet, the city has been well called 'the home of magnificent distances.'
4. Louisville, which is about the same size as Leicester, stands where the Ohio rapids cause a diversion of traffic, except when the river is in flood; and the fertility of the Kentucky 'blue limestone' has given it the trade of a magnificent pasture and fibre district, the special products being horses and tobacco. The town also shares in the glass-trade of New Albany.

N.B.—A canal enables the river-steamers to avoid the rapids.

5. Minneapolis and St. Paul are as large, respectively, as Portsmouth and Bolton. They stand 8 miles apart just below the St. Anthony Falls on the Mississippi, at equal distances from the Atlantic, the Pacific, the Hudson Bay, and the Gulf of Mexico; and thus they have become a great transport centre.

They are so near to the Great Lakes that their railway rates have to compete with the rates by water, and there is the further competition of three railways from St. Paul to Duluth; and, as they are in the centre of the richest wheat area in the States, they have become one of the most important grain and flour markets in the world.

N.B.—The one obstacle to railway extension lies in the huge distances, and this is met by laying only a single track.

Minneapolis has the advantage of being the nearer to the Falls, which supply the mechanical power for the mills, and which are the actual head of navigation; St. Paul has the advantage of having the deeper water, as the Minnesota tributary joins the Mississippi below Minneapolis, and of being on the Duluth side of the river.

N.B.—The climate of the Mississippi route is not so favourable for the export of wheat as the more 'temperate' climate of the St. Lawrence or the New York route.

5. Of the twenty cities with populations of from 100,000 to 200,000, five (including St. Paul) have over 170,000

1. Indianapolis stands on the edge of the central coal-field, in the middle of half a dozen extremely important towns—Chicago, St. Louis, Cincinnati, Cleveland, Pittsburg, and Louisville. It is a junction for at least 15 main lines of railway.
2. Providence, a safe harbour, is about as large as Cardiff or Bolton. It was originally a place of refuge for persons who were persecuted by the Puritans; but its position, where the coast railway from New York to Boston crosses the top of Narragansett Bay, has made it a very important manufacturing centre. It specialises in the two great necessities—cotton and woollen goods, and in jewelry.
3. Kansas City stands in the west of the great maize area and the east of the great cattle area of the country. It is a very important railway junction, and the down-hill grade enables very heavy trains to be run to the gulf ports. The climate is very healthy, the death-rate being only 11.50 per 1000; and the dry air and the abundance of grain make it one of the greatest egg markets in the world, with a production of about *twenty-one and a half million dozen* per year.

N.B.—Of course, it ought to have excellent navigation up and down the Missouri, but it stands just where the Kansas and the Missouri drop on to the 'bottom' lands, and where, therefore, they deposit so much mud that almost no use is made of the waterway.

4. Rochester owes its importance to the Genesee Falls, which drive huge flour-mills, and to its facilities for exporting the flour either *via* the Erie Canal or *via* Lake Ontario, from which it is only 7 miles distant.

N.B.—The Genesee descends 226 feet within the city boundaries, forming three falls of 96, 25, and 84 feet respectively.

6. Five cities (including Toledo, cf. p. 178) have populations varying between 145,000 and 120,000.

1. Denver stands where several railways converge to cross the Rockies, by the South Platte valley, to the great silver district of Leadville.
2. Alleghany, which is only as large as Brighton or Derby, is a twin town with Pittsburg, and has direct communication by river and canal with Lake Erie; it is by this route that the Michigan iron ore reaches Pittsburg.

3. Columbus, the political capital of Ohio, is in the very centre of the State, and has thus become an important railway junction.
4. Worcester, on the crest of the watershed which supplies eastern Massachusetts with mechanical power, is on the main line west from Boston, and makes machinery for the large textile industries of the State.
7. Nine towns have populations of rather more or rather less than 110,000.
 1. Syracuse stands on the main line from Boston to Buffalo, in the rich salt area round the junction of the Erie and Oswego Canals.
 2. New Haven is a harbour on Long Island Sound which is completely overshadowed by the proximity of New York ; it has very large oyster-beds, and manufactures metal goods. It is the seat of Yale University.
 3. Paterson, which is practically an inland suburb of New York, specialises in silk goods, and has abundant water-power from a fall of 70 feet on the Passaic river.
 4. Fall River, like Lowell, is one of the great cotton centres which have made Massachusetts the first textile State in the Union. Its climate is much more favourable for textiles than that of the inland towns (cf. p. 14), and it has an excellent harbour.
 5. St. Joseph is an important grain centre on the Missouri, and has a very large wholesale trade.
 6. Omaha stands where the direct line from Chicago to San Francisco crosses the Missouri, and begins to climb the Platte valley ; it has very large engine works, the river is navigable, and the maize lands round support a large 'hog' trade. It is also a great cattle market, and has important works for smelting and refining precious metals.
 7. Los Angeles is the largest town in the south of California, and has a busy fruit market, the fruit—oranges, olives, walnuts, etc.—being exported from Santa Monica.
 8. Memphis is a river-port which ships the cotton and tobacco of western Tennessee to New Orleans ; and the construction of the new bridge across the Mississippi has attracted all the southern trans-continental railway traffic, to the prejudice of St. Louis. It stands, like Vicksburg, Natchez, and Baton Rouge, on a bluff—which offers special facilities for bridging the river.

9. Scranton is an important station where the main line from New York to Buffalo enters the anthracite coal-field of the Susquehanna valley.

8. Eight towns (including Portland and Seattle) have populations of rather more or rather less than 95,000.

1. Lowell is the most important of several towns—including Manchester, Nashua, and Concord—which use the enormous water-power of the Merrimac in manufacturing cotton. [Estimated to be 100,000 in 1903.]
2. Albany, the political capital of New York State, stands where the main line from Boston to Buffalo crosses the Hudson River just below the head of navigation ; and the confluence of the Mohawk and the Hudson gives special facilities for rail and canal to Montreal and Buffalo.
3. Cambridge is simply a suburb of Boston, and contains the great University of Harvard. Like many other University towns, *e.g.* Oxford and Edinburgh, it is a great printing and publishing centre.
4. Atlanta, the political capital of Georgia, like its neighbour Augusta, uses the water-power of the Blue Ridge in manufacturing the local cotton ; and its height makes it much more healthy than the other towns of Georgia. It stands where several railways converge to pass round the end of the Appalachian Mountains.
5. Grand Rapids stands on the western edge of the magnificent forests and rich salt-beds of the Michigan peninsula, just where the railway from the great meat-packing metropolis of Chicago crosses the Grand River. It sends timber to Chicago, and has a huge furniture industry of its own.
6. Dayton is an important junction where the main line west crosses the Miami River. It shares in the special trades of Cincinnati, and uses the hard-wood of Ohio in the manufacture of agricultural implements. The oak forests also supply splendid feeding-ground for immense herds of swine.

9. Nine towns have populations of rather more or rather less than 80,000.

1. Richmond, the political capital of Virginia, is the most convenient centre for the three great 'tobacco valleys' of the James, the Roanoke, and the Rappahannock, and has very large tobacco factories. It is at the head of tidal water on the James River.

2. Nashville, the political capital of Tennessee, stands in the centre of the State on the Cumberland River, between the mineral wealth of the upper Tennessee plateau and the agricultural wealth (tobacco and cotton) of the Mississippi lowlands.
3. Hartford is the political capital of Connecticut, and stands at the head of steamboat navigation—when the river is open (March to December more or less inclusive). It is noted for carpets and 'Colt' pistols.
4. Wilmington is an important ship-building centre on the Delaware estuary, where it has easy access to splendid coal and iron; and it has the largest gunpowder works in America.
5. Reading is on the edge of the anthracite coal-field in the Schuylhill valley. It contains the chief 'repairing shops' of the *Reading Railway*.
6. Camden is an important railway centre on the Delaware estuary just opposite Philadelphia, and commands the huge fruit and vegetable trade of the 'market garden of New Jersey' across the estuary to the dense population in and round Philadelphia.
7. Trenton, which stands on the isthmus at the head of the estuary, is the natural political capital of the State, and commands a similar fruit and vegetable trade to New York. It also has a very large brick and pottery industry of its own in connection with the rich clay beds of New Jersey.

N.B.—The Delaware and Raritan Canal gives continuous navigation to New York, Philadelphia, and Baltimore.

8. Bridgeport is a harbour in Long Island Sound near the mouth of the river on which the famous Waterbury-watch factories stand.
9. Troy is at the head of navigation on the Hudson, and thus has been made the eastern terminus of the Erie Canal. It also utilises the falls in various industries including hardware. Cf. Waterbury.

10. Nearly twenty other towns (including Charleston, Duluth, and Savannah) have over 55,000.

1. Most of them, *e.g.* Lawrence, New Bedford, Hobsken, and Manchester, are in the great N.E. textile area.
2. Others are engaged in hardware in the same N.E. area, *e.g.* Springfield (U.S.A. Armoury) and Utica.

3. Lynn is practically a suburb of Boston, and has a very large boot and shoe industry.
4. Oakland is the residential 'quarter' of the rich San Francisco merchants.
5. Des Moines, Evansville, and Peoria are great grain centres, Peoria being also a very important railway junction.
6. Salt Lake City, besides having great historic interest, is an important railway centre, cf. Spokane.
11. Among smaller, but still important, towns are San Antonio, Houston, Dallas, and Little Rock.
 1. Dallas is a grain centre, and San Antonio and Houston are railway centres in Texas; and Little Rock is the political and commercial capital of Arkansas. Being in the middle of a cattle and cotton district, it makes very large quantities of oil-cake.

N.B.—An inland town which has no navigable river, generally specialises on small articles. Cf. the screws and nails of Birmingham, and the toys and clocks of Nürnberg.

12. Key West, Burlington, and Rutland are quite small places of 10,000 to 20,000 inhabitants.

1. Key West is a coral island, and ships sponges, oranges, and timber; Burlington is the best harbour on Lake Champlain, and has a lumber trade; Rutland is the site of the great marble quarries of Vermont.

MEXICO.

Surroundings and Surface.

1. MEXICO has nominally a land frontier on the north and the south; but the southern frontier, owing to its shortness and its position, has practically no effect on either commerce or climate. The country may therefore be said to have sea on every side except the north.

1. The coast is very long in proportion to the area, but not much broken; the land frontier is only 125 miles in the south, but four times as much in the north.

2. There are several marked differences between the two coasts.

1. The west coast is more than twice as long as the east, and half of it is outside the Tropics.
2. The west coast is high and rocky, with one or two really fine bays ; the east is low and fringed with sand-banks, and has not a single natural harbour.
3. The west coast is exposed and comparatively healthy, while the east is shut in and awfully unhealthy.

3. The chief ports on the east coast are Vera Cruz and Tampico, both of which have been provided with artificial harbours, and on the west coast Acapulco and Mazatlan.

1. Vera Cruz stands in the centre of the Gulf coast, and has behind it the densest population of the country, including the cities of Mexico and Puebla ; but its climate is so terrible that its population is less than 25,000. In fact, it is simply a filthy, fever-haunted gateway to the plateau ; and the same is true of nearly all the harbours.
2. Tampico is in a rich agricultural district with very valuable minerals behind it, and—for Mexico—it has easy communication inland by rail to St. Luis Potosi, the great railway junction on the eastern edge of the plateau. It is becoming more important than Vera Cruz.

N.B.—The railway from Vera Cruz to Mexico ascends more than 8000 feet in 80 miles !

3. Acapulco is a fine natural harbour exactly on the meridian of 100° W. ; and, as it is much less shut in than Vera Cruz, it has a much better climate. Its commercial importance is injured by the difficult communication inland.
4. Mazatlan owes its importance partly to the fertility of the lowlands behind and to the north of it, and partly to its position at the entrance of the Gulf of California.
5. San Blas and Manzanilla, by being connected with Mexico by rail, will become termini of trans-continental routes ; and Guaymas has easy access by rail into the United States, the junction with the Southern Pacific Railway being at Nogales. Coatzacoalcos and Salina Cruz, the termini of the Tehuantepec Railway, are becoming very important.
6. On the Yucatan peninsula there are the two roadsteads of Campeachy and Progreso, both connected by rail with the great henequen district of Merida.

4. The mass of Mexico is a high triangular plateau shut in by a low strip of narrow plain along each coast.

1. The plain along each coast is divided from the plateau by a mountain chain, the Sierra Madre 'Oriental' and 'Occidental'; and the plateau sinks and broadens from the great peaks of Popocatepetl and Orizaba down to the valley of the Rio Grande.
2. The longest rivers must therefore flow northwards, and will probably empty into lakes, fresh or salt.
3. South of the highest peaks lies the lowest depression, the Isthmus of Tehuantepec; the peninsula of Lower California is a barren 'sierra,' and that of Yucatan is a forest-clad plateau.

5. The climate varies, with the height, from tropical heat to perpetual snow, and, with distance from the sea, between extremes of damp and drought.

1. Though so large a proportion of the country is in the Tropics, its great average height materially modifies the heat.
2. As the mountains run parallel to the coasts, they prevent wet winds from penetrating inland; and the dry climate is very healthy, counteracting even the filthy habits of the people, but it necessitates irrigation for successful agriculture.
3. The low level, the great heat, and the heavy rainfall make the coast strip very fertile, but terribly unhealthy; and, therefore, nearly the whole population lives on the plateau.
4. In the north the distance of the interior from the sea, the presence of mountains parallel to the coasts, and the absence of mountains along the U.S.A. border cause great drought and extremes of climate similar to those of Arizona and New Mexico. Cf. p. 141.
5. The heat and the height cause such rapid evaporation that the temporary lakes of the rainy season are soon converted into salt marshes.
6. The intense heat of the great basin of California, like that of the Tibet Basin, causes a monsoon wind in summer; and therefore there are only two seasons—wet (May to November) and dry.

N.B.—The Mexicans themselves call the low unhealthy area *tierra caliente*, the general plateau *tierra templada*, and the region above 7000 feet *tierra fria*—i.e. 'hot,' 'temperate,' and 'cool' lands.

Productions and Towns.

1. The vegetation, of course, varies with the climate and the soil—the latter being largely volcanic, and therefore very fertile.

1. The 'hot lands' are covered with forests—of mahogany, log-wood, rosewood, ebony, etc., and produce all sorts of tropical vegetation.
2. The 'temperate lands' are covered with various species of cactus, on some of which the cochineal insect feeds, and produce maize, beans, and agave, for the dense population on them.

N.B.—Maize and beans are the chief food, and agave makes 'pulque,' the national drink.

3. The 'cool lands' produce wheat and barley, and have splendid natural pastures for cattle.

2. The tropical vegetation includes coffee, cotton, cacao, vanilla, sugar, bananas, tobacco, rubber, jalap, and henequen.

1. The coffee and bananas are grown on the forest-clad seaward slopes of the mountains, the cacao and vanilla on the sheltered strips of volcanic plain, and the sugar and tobacco on the parts of the exposed coastal lowlands that are rich in lime, *e.g.* the Vera Cruz district.
2. Henequen and cotton are grown round the Gulf of Campeachy, the former in Yucatan and the latter where the water-power for manufacturing is greatest—behind Vera Cruz. The more important for export is the henequen, which is both cheaper and stronger than jute.
3. The rubber grows best on the isthmus of Tehuantepec, and the jalap on the mountains round Xalapa—from which place, indeed, the drug takes its name.

3. The mineral wealth is very great, especially in silver, along with which lead is found. The other most important products are gold, sulphur, iron, and coal.

1. The silver is found in two main areas. One is along the Central Railway from Zacatecas to Mexico, especially between Zacatecas and Guanajuato; and the other is in the valley of the Pesquero, especially near Monterey.

2. The largest amount of gold is also found—along with very pure copper—round Guanajuato.
 3. The coal is found on both the northern edges of the plateau—in the east where the International Railway to San Antonio, U.S.A., crosses the Sabinas River, and in the west behind the harbour of Guaymas in the valley of the Rio Yaqui. It is of poor quality, but is very useful to the railways—on which so much depends in the absence of navigable rivers.
 4. The iron, which is of superb quality, is found in enormous quantities on the slopes of the Sierra Madre, especially round Durango.
 5. The sulphur is found perfectly pure in the crater of Mount Popocatepetl, and the export of it is a special industry in Puebla.
4. There are six towns with a population of over 50,000.
1. Mexico is very nearly the same size as Belfast. It stands on Lake Tezcuco, a mile and a half above the sea, half way between the Atlantic and the Pacific coasts. It is the political capital and the great railway centre of the country.
 2. Guadalajara and Puebla have respectively just over and just under 100,000 inhabitants. Besides its sulphur industry, Puebla collects the maize and agave of the rich volcanic valley up which the railway from Vera Cruz to Mexico runs, and works the so-called Mexican 'onyx.'
- Guadalajara stands on the continuation of the same line to San Blas, just where the Santiago River begins to descend from the plateau, and is famous for pottery.
3. S. Luis Potosi, Monterey, and Leon have populations of about 60,000. S. Luis is the junction for traffic from the plateau to Tampico, and Leon, amongst the rich pastures of the central plateau, has a very large leather industry.
 4. Guanajuato, Pachuca, Merida, and Morelia have populations of about 40,000, and Aguascalientes and Oaxaca about 35,000. Merida is the centre of the great henequen district of Yucatan.
- N.B.*—Queretaro, the centre of the famous opal industry, has nearly 35,000.

CENTRAL AMERICA.

General Geography.

1. THE six Republics of Central America are mongrel caricatures of the United States ; and their land is subject to all the vast, terrible, and unreliable phenomena characteristic of mountainous areas near tropical seas—*e.g.* earthquakes, volcanic eruptions, sudden thunderstorms, etc.

1. Like the similarly placed Republics of South America, therefore, they afford some valuable object-lessons in political geography, for revolutions are almost as common as earthquakes,—the political disquiet of their peoples being simply the counterpart of the physical disquiet of their land.

N.B.—Earthquakes are caused by a change in the weight of the earth's crust, and this itself is caused mainly by the removal of masses of soil from mountain tops to the ocean floor. Contrast the freedom from earthquakes on low inland plains in temperate latitudes, *e.g.* Russia or Canada.

2. The coast line is very long in comparison with the surface, and the eastern portion differs considerably from the western.

1. The western is a more or less straight strip of steep cliffs, with deep ocean water immediately off it and with a range of mountains immediately behind it.
2. The eastern is divided between the forest-girt Bay of Honduras and the low 'Mosquito' swamps, and opens on a very shallow portion of an inland sea.
3. The best harbours are, therefore, on the Pacific; but those which face the West Indies and Europe, have at present most trade.

3. The surface is generally a rough high plateau, bordered along the Pacific coast by parallel ranges of mountains and along the Gulf of Mexico by a broad low swampy plain.

1. Many of the mountains are volcanic, which accounts for their rapid 'weathering,' and thus for the richness of the lowland soil; and some of them reach a height of 13,000 feet, *i.e.* four times the height of Scawfell or Ben Lomond.
2. Their height, their direction, and their nearness to the sea cause a very heavy rainfall, which materially hastens the 'weathering' and removes the 'weathered' soil; and, therefore, the rivers, though not long, have a great and constant volume. The longest is the San Juan, which is about half as long as the Thames.
3. The deep depression across the south of Nicaragua has accumulated enough water to form the large but shallow lakes of Nicaragua (115 miles long by 45 miles broad) and Managua (35 by 20). Cf. p. 126.

4. The intense heat and heavy rainfall make the climate very unhealthy except on the higher levels, but also make the rich volcanic soil produce most luxuriant vegetation.

1. Forests of valuable cabinet and dye woods—such as mahogany, rosewood, logwood, and fustic—cover almost the whole area, and are mainly responsible for the appalling superabundance of offensive insects. Cf. the name '*Mosquito*' coast.
2. The forest-clad seaward slopes of the lower ranges form an excellent site for coffee trees. Costa Rica is even called 'the Coffee Republic.'
3. The low coast plains offer an equally good site for sugarcane, and the sheltered volcanic valleys for cacao.
4. The high western plateau supplies magnificent pasture for cattle, which accounts for the large export of cattle and hides and for the local leather industries.
5. Bananas and maize are grown nearly everywhere; good tobacco comes from the eastern lowlands of Honduras, and the best indigo in the world from the lowlands of San Salvador.

5. The mineral wealth is probably very great, and is known to include silver, gold, and zinc; but it is quite undeveloped.

1. The mines nearest to navigable water, and therefore the most worked hitherto, are the gold mines of the Mosquito Reserve, just behind Blewfields; but the richest seem to be the silver mines of Honduras.

Individual States.

1. British Honduras is essentially typical of Central America. It has a low swampy plain along the sea and forest-clad mountains inland.

1. The coast is fringed with coral 'keys,' amongst which turtles are very abundant.
2. There are several navigable rivers, two of which, the Hondo and the Sarstoon, form convenient political frontiers on the north and the south. The most important river is the Belize, on the the estuary of which stands the little town of Belize (= Dartmouth or Morecambe), the political and commercial centre of the colony.
3. The forests supply mainly logwood and mahogany, the timber being cut in the dry season and floated down the rivers in the wet season; and the export depends on the height of the flood.

N.B.—The softening effect of the marshes rather spoils the quality of the mahogany.

4. The forest area supplies also coffee, india-rubber, and rose-wood.
5. The lowlands produce henequen, sugar, and very large quantities of fruit, especially bananas and pineapples.

2. Guatemala is mainly one high plateau, and therefore has a comparatively healthy climate; it has access to both seas—the general slope of the country being towards the Gulf coast, though the Pacific coast is so much the larger.

1. On the Pacific, the roadsteads of San José and Champerico have railway communication respectively with New Guatemala and Quesaltenango; and the Gulf ports of Puerto Barrios and Livingston have easy access up the Montagua valley to New Guatemala, though the projected railway is not finished yet.
2. The forest-clad slopes of the mountains, besides being very beautiful, produce very large quantities of coffee; and cacao, india-rubber, and bananas are being developed, but are practically waiting for transport.
3. New Guatemala is sufficiently high and sufficiently sheltered from the wet Trade winds to be healthy, and has thus become the largest town in Central America—with a population of about 95,000.

N.B.—Old Guatemala was just at the foot of two volcanoes, but was destroyed so often that the capital had to be moved out on to the plateau.

3. Salvador consists of a low and very narrow coastal plain backed by a rough volcanic plateau, which runs inland for about 50 miles, the sea-front extending for about 150.

1. This coast plain, especially round Libertad, grows the famous 'Balsam of Peru' and indigo.
2. As the high mountains behind the plateau completely shut out the wet Trade winds, the climate is perfectly healthy inland and not very unhealthy even on the coast. Consequently, the population is denser than in any other State of Central America.
3. There are three ports—Acajutla, Libertad, and La Unión, and three corresponding inland towns—Santa Ana, San Salvador, and San Miguel. Both Acajutla and Libertad are connected by rail with San Salvador, the political and commercial capital, and Acajutla is also connected with the coffee centre of Santa Ana; La Unión, the best harbour of the three, is to be connected with San Miguel.

N.B.—San Salvador, which has now a population of about 60,000, was shaken to pieces so often that its site was changed, but the new site is no better.

4. Honduras, like Salvador, is mainly a rough plateau. It slopes down to the north from a natural boundary of mountains along the Nicaraguan frontier, but it has the strip of coast along the Gulf of Fonseca.

1. It has three harbours—Omoa, Truxillo, and Amapala. Omoa is the only one with any railway communication, and it has only 37 miles (to San Pedro Sula) ; Truxillo does the most trade at present, and Amapala is the best natural harbour.
2. There are magnificent cattle pastures on the uplands, forests of mahogany and rubber along the Truxillo coast, and tobacco plantations west of Cape Gracias à Dios.
3. The mineral wealth is considerable, and includes rich deposits of silver between Tegucigalpa and Amapala, but it is waiting for transport.

N.B.—The capital has been moved from the cattle centre of Comayagua to Tegucigalpa, which has now about 35,000 inhabitants.

5. Nicaragua is the largest of the Central American States, and has a larger coast, a more varied surface, and greater natural wealth than any of the others ; but its advantages have hitherto been neutralised by its political disquiet.

1. The Gulf coast is lined with salt lagoons, such as the Pearl and the Blewfields, which are of very little use ; but the San Juan river provides a fair harbour in Greytown, with deep water immediately off the shore. On the west the Gulf of Fonseca and the Bay of Salinas are natural harbours, but are so far from populous centres that most of the traffic is done by Corinto, which has communication by rail up to Lake Nicaragua.

N.B.—The development of Brito depends on a Ship Canal. Cf. p. 126.

2. The surface presents the usual Cordilleran backbone and rough plateau flanked by low coast plains, but the plains are unusually broad. East of the mountains the land slopes gradually down into the low alluvial plain which merges in the Mosquito swamps ; west of them there is the deep depression filled by the lakes.
3. The climate is naturally very even and very unhealthy except in the great western depression, which is sheltered from the Trade winds by the mountains. Consequently, all the important towns—Managua, Granada, Chinandega, Rivas, and Masaya—are in the west. The busiest is the capital, Managua ; but it is no larger than Hereford.

N.B.—The old capital was Leon, which is a larger town, but it was so often shaken to pieces that it had to be abandoned as a capital.

4. The eastern plains support a very large number of cattle ; there are dense forests in the centre, especially of fustic ; and the rich western valleys raise almost every kind of tropical and semi-tropical vegetation, especially coffee, sugar, bananas, and tobacco.
5. The eastward spurs of the mountains and the Mosquito Reserve are rich in minerals. Gold is mined near Blewfields and from Libertad to Matagalpa, the water-power of the Rio Grande being very useful ; and silver is mined near Ocotul, where the Rio Coco provides water-power.

N.B.—The Coco, like the San Juan in the south, makes a convenient—because indisputable—political boundary.

6. Costa Rica consists of a lofty backbone of volcanoes flanked on the east by unexplored forests ; the climate is naturally very moist and mild, and the volcanic soil is extremely fertile.

1. Coffee and bananas are the chief agricultural exports ; cattle-rearing is an important industry, and the forests supply fustic and rubber.
2. The mineral wealth is at last being worked, and is mainly in gold and silver ; and the La Trinidad mines are proving so productive that they are beginning to justify the country's title of 'The Rich Coast.'
3. The capital, San José, which is about the same size as Managua or Granada, stands on the west—*i.e.* the dry and healthy—side of the mountains ; but it has railway connection with the Gulf port of Limon *via* Cartago as well as with the Pacific port of Punta Arenas *via* Alajuela, and nearly all the bananas are exported from Limon.

N.B.—San José has been repeatedly destroyed by earthquakes.

7. Panama, which at present is independent of Colombia, owes its importance simply to its facilities for inter-oceanic commerce.

1. The canal is following the general route of the railway from Colon to Panama town *via* the Col de Culebra. Cf. p. 126.

THE WEST INDIES.

General Features.

1. As the West Indies lie in a double curve from the peninsula of Florida to the mouth of the Orinoco, they separate the deep basins of the Mexican Gulf and the Caribbean Sea from the Atlantic, and lie directly in the course of the Gulf Stream and of the north-east Trade winds.

1. They have an aggregate area rather larger than that of Great Britain, and fall into four natural groups—the Bahamas, the Greater Antilles, the lesser Antilles or Windward Islands, and the Leeward Islands.

2. The Lesser Antilles are often divided into the Leeward (the northern), and the Windward (the southern) Islands, but such a division is absurd. All the group, from the Virgins to Trinidad, are in the very teeth of the Trade *winds*; and it is only the inner group along the Venezuelan coast that is to *leeward*.

3. The name 'West Indies' perpetuates the mistaken idea of Columbus that, when he reached the Bahamas, he had sailed round the world to India; and Antillia, or Anthelia, was the name given by the mediæval geographers to an imaginary land with which they filled up the unknown west—the region 'away from the sunrise.'

2. Almost all the islands—except the Bahamas—are mountainous, but have low coast plains.

1. The Bahamas are a low coral group.

2. The Greater Antilles—*i.e.* practically Cuba, Haiti, Jamaica, and Puerto Rico—have ranges running through them from east to west, and rising to over 7000 feet in Jamaica, 8000 in Cuba, and nearly 10,000 in Haiti, *i.e.* from more than twice to more than three times the height of Scaw Fell or Ben Lomond.

3. The Lesser Antilles, which are really a line of volcanic peaks, rise to 4000 feet in St. Lucia, nearly 5000 in St. Vincent, and over 6000 in Dominica, *i.e.* from twice to three times the height of the Peak or Yes Tor.

3. All of the islands—except, again, in the Bahama group—are within the tropics, and have an essentially tropical climate.

1. The tropical heat, is however, greatly modified by the daily sea-breezes, the Trade winds, and the considerable elevation.
2. There are two seasons, the wet and the dry ; the wet season lasts from May to December, and the dry season from December to May.
- 3 If, in addition to the great heat and great moisture, there is also calm air for any length of time, the three conditions are present which give birth to hurricanes ; and this often does occur in August and September, when the heat and the moisture are greatest.
4. The direction of the mountains, and their nearness to the sea, cause them to present such a full face to the wet 'Trades' at their wettest, that the rainfall on their windward side is excessively heavy ; and, therefore, the leeward parts of the islands are much the healthier, especially in summer, and contain all the important towns.
5. The force of the Trade winds has caused all the windward coasts to be clogged with driven sand, so that all the good harbours are also on the leeward side. Cf. pp. 207, 212.

N.B.—The most exposed islands are, naturally, the healthiest, *e.g.* Barbados, Antigua, and Dominica—the last combining exposure with height and with a very porous soil.

4. The soil is very fertile almost everywhere—except, once more, in the Bahamas.

1. The coral formation of the Bahamas is covered with only a thin layer of sandy loam.
2. The soil elsewhere is largely volcanic, and therefore needs only heat and moisture to make it produce enormous crops.
3. In most of the islands there is also an immense natural supply of potash manure in the soil, in the form of vegetable refuse ; and some of them, *e.g.* Sombrero, Redonda, St. Martin, Aruba, and Navassa, are rich in phosphates of lime. Cf. p. 210.

5. The hilly character of the islands aids the heavy rainfall in increasing the natural fertility of the volcanic soil.

1. The heavy rain washes down to the roots of the plants a large quantity of the carbonic acid, ammonia, and nitric acid of the atmosphere.
2. The porous soil sucks in the water before it can escape in surface floods. Contrast the Loire basin in France, p. 66.
3. At the same time, the general slope prevents the water from stagnating round the roots of the plants, and facilitates artificial drainage.

N.B.—The salt sea-breezes are favourable to the great staple—sugar.

Vegetation.

1. With such a soil and climate, the vegetation is naturally very luxuriant, and includes almost all tropical plants.

1. Sugar has hitherto been the great staple, but the industry has been greatly injured by unscientific culture,—by the incurable laziness of the emancipated negroes, and the ease with which in all the islands they can grow maize—and by the competition of beet-sugar, especially from Germany and France, where heavy bounties promote the export artificially.

2. Sugar is, however, like maize, a natural product of the West Indian soil and climate, for it needs great heat and moisture, is not injured by sea-winds, and grows best on low alluvial deposits of volcanic soil where there is also lime. Cf. p. 14.

1. Cuba exports twice as much cane-sugar as any other country in the world—Java coming second; and Jamaica, Trinidad, and Barbados also produce large quantities.

N.B.—The amount of rum that can be made from 1 cwt. of sugar varies with the humidity of the climate and the season.

3. Tobacco has ranked next to sugar in the past; but, like the sugar, it is becoming of relatively less

importance, and the recent political troubles in Cuba did considerable harm to the industry.

1. The plant requires a light sandy loam, very rich in lime, potash, and forest refuse; and the climate must combine considerable moisture with lowland heat.
2. The best cigar-leaf in the world has hitherto been grown in the Vuelta-abajo district, and Havana has thus become very famous for the manufacture of cigars.

N.B.—There is a very significant *import* of tobacco from the Philippine Islands, Brazil, Germany, and elsewhere into Cuba!

3. Tobacco is also grown in some of the other islands, *e.g.* Tobago, Trinidad, and Puerto Rico: and there is no reason why it should not be grown widely wherever the soil suits, *i.e.* on any forested coral formation, where it can get lime and vegetable soil.

4. In recent times coffee has become the greatest rival of the sugar and tobacco, both the Arabian and the Liberian varieties being grown. Cf. p. 14.

1. As the plant is grown so largely for export, the plantations should be as near the sea as possible—*e.g.* on a small mountainous island. Thus, Kingston stands below the lee-ward side of the forest-clad Blue Mountains, and Jamaica is the most sheltered of all the West Indian islands from the Trade winds.
2. The Liberian or Lowland coffee has several advantages; it is much the more prolific, though the berries do not give quite so much 'clean coffee' to the bushel; its full crop comes in January, the dry season, instead of in August, the season of the hurricane rains; and the berries do not fall off the trees as soon as they are ripe, but can be gathered at leisure—a very important point where labour is scarce.

N.B.—Tea requires a precisely similar soil and climate except that the presence of iron is desirable, and both the Chinese mountain variety and the Assam lowland variety might be grown with assured success, *e.g.* on the iron-stored mountains of Cuba or the iron-stored lowlands of Guadaloupe; but it is unaccountably neglected.

5. Cacao has also become a very important product in recent times. The plant has been found growing wild in Jamaica and Martinique—the best proof that both soil and climate are favourable; and the cacao of

Trinidad and Grenada actually ranks next to that of Venezuela in the market.

1. Like the coffee, it is grown almost entirely for export, which is an additional reason for its being grown near the sea; but it is an entirely lowland plant, and can flourish in a drier climate than the coffee—*e.g.* in Dominica and Grenada.
2. Like the coffee, it needs, too, protection, especially from hurricanes; and the young plants require shade, which can be well—and profitably—supplied by the banana.
3. The chief crop is gathered at Christmas, and a subordinate crop at Easter,—both, therefore, being gathered during the dry season.

6. The other characteristic products of the West Indies are fruits, spices, drugs, dyes, and certain food tubers.

1. The fruits include oranges, limes, bananas, pine-apples, and coco-nuts; the spices include ginger, pimento, nutmeg, cinnamon, cardamom, vanilla, and pepper; the drugs include cinchona and castor; the dyes include anatto and logwood; and the tubers include cassava, yams, talias and arrowroot.

7. Of the fruits, the orange comes to great perfection, especially in Jamaica, the Bahamas, and Dominica; and the West Indies have a great advantage over Florida in the entire absence of frost. Cf. p. 142.

1. Like the coffee and the cacao, the orange has a long root and needs a deep soil; but its roots take such firm hold of the ground that the tree can withstand even hurricanes, and therefore can be planted as 'shelter' for coffee and cacao trees.

It grows well outside the tropics, *e.g.* in Sicily, but it is much more prolific inside them; and the best fruit is raised in warm, moist sunny spots on the lower mountains (up to 2000 feet), especially in Dominica and Jamaica.

2. The lime grows on the same kind of soil as the orange, but prefers a lower elevation in a well-wooded sheltered valley; Montserrat and Dominica produce the best fruit, but Jamaica and Trinidad are also exporters.

8. Bananas, pine-apples, and coco-nuts all require a typical tropical climate, though the bananas can flourish at a greater height than the two others.

1. The 'sugar' and 'cacao' lands of Jamaica grow the best bananas, in literally millions, and the product of Martinique, Cuba, Dominica, and Trinidad is very good.

N.B.—The banana is 'the bread and potatoes of the tropics.'

2. The pines require sandy loams in which there is lime, and therefore do best in the coral formation of the Bahamas and in the limestone part of Antigua; but Jamaica and Anguilla also grow a large number.
3. The coco-nut palms grow along the coasts, especially of Trinidad, Jamaica, and the Cayman Islands, where they are a great protection against the progress of the driven sand inland. Cf. p. 203.

9. All the spices except pimento grow best on a rich, loose soil, with plenty of vegetable refuse in it, and need great heat and moisture; and, therefore, all of them can practically be grown all over the West Indies, though some of them grow specially well in particular islands.

1. Pimento ('allspice') grows best on a poor soil, and needs a rather dry climate; and, therefore, it flourishes most on the stony north shore of Jamaica, though it also does well in Dominica (for 'bay rum').
2. Nutmeg and cinnamon (Grenada), pepper (Jamaica and Trinidad), and vanilla (Guadeloupe) either absolutely require, or do best at, low elevations.
3. Cardamom (Trinidad) must have height and shade; ginger (Jamaica) is indifferent to height, but must have a rich soil.

10. The drugs, dyes, and tubers are less important.

1. Both cinchona and castor require rich and well-drained soils, which are most easily found on mountain slopes; and both are mountain plants, the cinchona requiring an elevation of from 3000 to 6000 feet if the bark is to yield any alkaloid. The cinchona, therefore, is largely confined to the mountain slopes of Jamaica and Dominica; while the castor grows wild on most waste lands throughout the islands up

to a height of 5000 feet, and is in some places a troublesome weed.

N.B.—Besides its medicinal properties, castor yields the best and safest lamp-oil in the world.

2. The logwood comes mainly from Jamaica, Dominica, St. Lucia, Haiti, and St. Vincent, and the anatto from Jamaica and Guadeloupe. Jamaica produces also mahogany and fustic, but the best mahogany in the world comes from Haiti, and the best fustic in the world from Cuba.
3. The yams and tania's are grown all over the lowlands—for local consumption; but the cassava (specially for tapioca) can only be grown in dry heat, and the arrowroot ought to be near really good spring-water for manufacture. The cassava, therefore, naturally grows best in Dominica, Martinique, and Guadeloupe, and the arrowroot in Jamaica and Tobago.

The Greater Antilles.

1. The Greater Antilles occupy seven-eighths of the total area of the West Indies; and, of that seven-eighths, half is represented by Cuba, with an area six times as large as Wales.

1. Haiti, the next in size, is very nearly four times as large as Wales.
2. Jamaica is rather more, and Puerto Rico is rather less, than half the size of Wales.
3. The other islands which are included in the group, *e.g.* Isle of Pines, Caicos, Turks, Caymans, etc., are quite small.

2. Cuba consists of a long low range of hills flanked by level plains, and terminating in the east in the high transverse range of the Sierra Mæstra.

1. The coast is fringed with lagoons, but has several good harbours, *e.g.* Havana, Matanzas, and Santiago; and even where it is otherwise useless, there are valuable sponge fisheries, the sponges being used in damping tobacco.
2. The mountains are covered with timber, including fustic, mahogany, and ebony; and those in the south-east also contain iron and copper.

3. The rivers, which flow northward and southward from this central watershed, are too short to be useful for navigation ; but they supply excellent drinking-water, and are very valuable for irrigating the plantations.
4. Havana, which is nearly as large as West Ham, is the political and commercial capital. It has, as its name implies, a magnificent *haven*. It is the most westward harbour of the West Indies, and practically commands both the Yucatan and the Bahama entrance to the Gulf of Mexico ; and it is the natural centre for the tobacco and sugar industries of the fertile western plains, over which there is a network of railways radiating from Havana.
5. Matanzas, which is about as large as Worcester, shares to a less extent the advantages of Havana ; Santiago, which is about as large as Oxford, ships the iron and coffee of the Sierra Maestra and the tobacco and sugar of the eastern plain ; Puerto Principe is an important inland railway terminus, and Cienfuegos is a railway junction on a fine bay.

3. Haiti, or San Domingo, which is as large as Scotland, is divided between the negro republic of Haiti and the mulatto republic of Dominica ; and the people of both are so lazy and so degraded that little advantage has been taken of either the very favourable position of the island for commerce or the extreme fertility of its soil.

1. The island lies between the two main entrances to the Caribbean Sea, and has an important harbour on each—Port au Prince on the Windward Passage, and the fine bay of Samana on the deep Mona Passage.
2. *Haiti* means 'high hills,' and the surface is very hilly. The broad Sierra del Cibao extends throughout the whole length of the island, running out in the west into two bold peninsulas ; and parallel to it on the north runs the Sierra de Monte Christi, inclosing the fertile Vega plain.
3. The forest-clad mountains of the west produce so much coffee that the Haiti republic sometimes stands next to Brazil and Java in the export of coffee. The special products of the Dominican republic are tobacco from the northern plains, especially round Santiago and La Vega, and sugar from the southern plains, especially round the town of San Domingo.

4. The other products of the island include cacao, logwood, and the best mahogany in the world.
5. Port au Prince, which is about as large as Reading, monopolises the trade of the western republic. The eastern, which is twice the size of the western, does most of its trade through Porto Plata, a little place the size of Durham; but the splendid harbour of Samana has now been connected by rail with La Vega and Santiago, and must attract the mass of the trade in future.

N.B.—San Domingo, the political capital, though no larger than Hereford or Inverness, is the oldest European town in the New World.

4. *Jamaica* means the “land of forest-rivers”; and, like Cuba and Haiti, the island has a line of forest-clad mountains running throughout its entire length, from which innumerable streams flow northward and southward across low coastal plains.

1. On these plains immense quantities of sugar are raised, and Jamaica rum is still said to be the best in the world. The coffee of the Blue Mountains has a similarly high reputation, and there is also a very important orange and banana industry—mainly with the United States. Cf. p. 207.
2. Amongst the other products are various spices, drugs, and dyes (cf. p. 207), and salt, phosphates of lime, guano, and turtles from the dependent islands—the salt mainly from the Turks and Caicos islands, the phosphates and the turtles mainly from the Caymans, and the guano from Morant and Pedro Cays. Cf. p. 203.
3. Kingston, which is about as large as Gloucester or Carlisle, is the political and commercial capital. It stands immediately under the lee of the Blue Mountains, with their immense vegetable wealth; it has a fine harbour on the land-locked bay of Port Royal; and it is the terminus of the double railway system which runs through the plantations of the interior. It is subject to earthquakes.
4. The old capital of Spanish Town was destroyed by an earthquake, but is now an important railway junction between Kingston and the two ends of the island—Port Antonio and Montego.
5. The other places of importance are mainly busy little ports, such as Savannah-la-Mar, St. Ann's, and Falmouth. The latter, like Port Antonio, suffered for a long time from

being in a Maroon district, *i.e.* a reserve held by rebellious Spanish slaves.

5. Puerto Rico, the most exposed of the group, is also the healthiest; and the healthy climate has attracted such a large population that, as in Barbados, even negroes have to work—or starve.

1. Like the three larger islands, it consists of a range of mountains running from east to west, flanked by strips of low plain.
2. This plain produces sugar and tobacco, especially round Ponce, with coco-nuts along the shore; the mountains produce excellent coffee, which is much the most important export; and the intermediate slopes are largely used as cattle pastures, as on the equally healthy island of Grenada.
3. San Juan, which is no larger than Torquay or Ayr, is the political capital and the chief port; the next largest town is Ponce. The only important inland towns are San German, which is connected by rail with the rising little port of Mayaguez, and Naguabo.

The Smaller Islands.

1. The smaller islands are in three groups—the Bahamas, the Lesser Antilles or Windward Islands, and the Leeward Islands.

1. The British Government use the absurd division of the *windward* islands into “Windward” and so-called “Leeward.”
 2. From this point of view the “Leeward” Islands include from the Virgins to Martinique, and the “Windward” Islands include from St. Lucia to Trinidad.
 3. The British colony of the Leeward Islands is a federation of the five presidencies of Antigua, St. Kitts and Nevis, Dominica, Montserrat, and the Virgins; the colony of the Windward Islands consists of St. Lucia, St. Vincent, Grenada, and the Grenadines; Tobago is attached to the colony of Trinidad, and Barbados forms a separate colony by itself.
2. The Bahamas consist of several hundred islands

(and thousands of reefs), with a total area as large as Yorkshire, but only twenty of them are inhabited.

1. They are of low coral formation, thinly covered with a good sandy loam, and lie directly in the path of the Gulf Stream ; and the innumerable reefs, with their warm lagoons, are the site of important sponge, turtle, and pearl fisheries, and of salt, guano, and ambergris industries.
2. The larger islands produce very large quantities of fruit and fibre, especially pine-apples and agave. Eleuthera is the chief fruit island ; Andros, the largest island, produces mainly the juniper or so-called pencil-*cedar*.
3. Nassau, the capital, is a town of some 11,000 inhabitants (=Ryde or Kilkenny) on the island of New Providence. It is a favourite winter resort for invalids, and has a "tortoise-shell" industry in connection with the turtle fishery.

3. The Leeward Islands proper stretch along the north coast of Venezuela.

1. The most important is Curaçao, a hilly waste on which the kind of bitter orange is grown that is used in the manufacture of the real Curaçao liqueur.
2. The chief product of the group is salt, especially from Oruba and Buen Ayre.
3. Willemstadt, the capital, is a town about the size of Lichfield or Armagh, on Curaçao. It manufactures liqueur, and is an important outpost for Dutch trade with Venezuela and Colombia.

4. The Windward Islands proper consist mainly of a series of extinct volcanoes shooting up through coral reefs, and therefore they have a peculiarly fertile soil. Most of them have a steep rocky shore with good harbours on the west, and a beach of coral sand banked up by the Trade winds on the east. Cf. p. 203.

1. Trinidad is more than twice as large as any of the others, having an area of about 1750 square miles—*i.e.* twice the size of Lanarkshire or Warwickshire or County Londonderry.
2. Guadeloupe is about the same size as Berkshire or County Westmeath (720 square miles) ; and Martinique is rather more than half the size of Guadeloupe.

3. Dominica (290) is rather larger, and St. Lucia (270) is rather smaller, than Middlesex or East Lothian.
4. Barbados (166) is rather larger, and Grenada (133) and St. Vincent (132) are rather smaller, than Rutlandshire or the Isle of Wight.
5. Tobago and Antigua are about 110 square miles apiece, St. Kitts and St. Croix about 70, Montserrat and Nevis about 50, and Anguilla, St. Thomas, and Barbuda about 30.

5. Trinidad, the most southerly of the West Indian islands, commands the approach to the Caribbean Sea from the south and the approach to the Orinoco from the north.

1. The Gulf of Paria makes a splendid natural harbour, and supplies the deficiencies of the two sheltered roadsteads of San Fernando and Port of Spain, while the exposed coral beach on the east produces millions of coco-nuts.
2. A range of high hills runs right along the north coast, and a smaller range runs up the middle of the island.
3. The soil is very fertile, and produces sugar and tobacco—the former in enormous quantities—on the sheltered western plain, and coffee and cacao on the forest-clad hills; fruits and spices are also increasing in importance.
4. In the extreme south-west there is the asphalt lake of La Brea, one of the curiosities of the world. It has been producing pitch ever since the days of Sir Walter Raleigh, and some 128,000 tons were taken out of it in 1904.
5. Port of Spain, which is about as large as Folkestone or Macclesfield, is the political and commercial capital, and is connected with San Fernando by a railway along the coast. San Fernando has also a short line inland to Princes Town.

6. Guadeloupe consists of two very distinct parts joined by an isthmus which is under water at high tide.

1. The western part is volcanic, and rises to a height of 5000 feet, *i.e.* a little higher than Ben Nevis; the eastern part is a low plain of coral formation.
2. The port of Pointe-à-Pitre, which is as large as Whitby or Montrose, stands on the south side of this isthmus. The political capital, Basseterre, is a little roadstead in the south-west.

3. The very fertile soil can produce all tropical products, including manioc, sweet potatoes, and bananas; but the special products are sugar, coffee, and dyes (anatto and longwood), and the remarkably damp climate encourages a large rum industry. Cf. p. 204.

7. Martinique is a mountainous island rising to the height of Ben Nevis (4400 feet), directly in the line of frequent earthquakes.

1. The principal town is St. Pierre, which is as large as Torquay or Doncaster; but the best harbour is Fort-de-France, which is only the size of Falkirk or Worthing. The political importance of this harbour, on the sheltered bay of Port Royal, has induced the French to provide it with dry docks and other conveniences.

N.B.—The stifling climate is admirably suited to sugar and rum industries.

8. Dominica and St. Lucia are two very mountainous British islands separated by the French island of Martinique. Cf. Dominica between the two French islands of Martinique and Guadeloupe.

1. Both islands are in the shape of a narrow leaf, with a high ridge of mountains up the middle and with two bays on the west—a large one in the north-west and a small one in the south-west—Portsmouth Bay and Roseau in Dominica, and Port Castries and Soufrière in St. Lucia.
2. Both, too, are thickly forested, and grow all the typical West Indian products; but St. Lucia exports mainly sugar and logwood, while Dominica exports mainly lime-juice and coffee. St. Lucia has a particular “crystalline” species of sugar-cane, which seems able to resist all climatic and insect plagues, and its cacao is very good.
3. Port Castries, though no larger than Cockermouth or Killarney (5500), has the best harbour in the Windward Islands; and, therefore, it has attracted the headquarters of the British troops away from Barbados.

9. Barbados is, however, the most important British possession in the West Indies after Jamaica and Trinidad, thanks to its position, soil, climate, and population.

1. It is the most easterly of the islands, and thus has a specially breezy and healthy climate, though subject to hurricanes.
 2. The healthiness of the climate and the fertility of the soil have attracted such a dense population that, as in Puerto Rico, even negroes are obliged to work—on the plantations or in catching and salting flying-fish ; and it was colonised largely by Scotsmen, who are always good colonists.
 3. As the whole island is flat and low, it is simply covered with sugar plantations.
 4. Bridgetown, the political and commercial capital, is a poor harbour, but a flourishing little town, as large as Stafford.
 5. As the original headquarters of the British troops in the Windward Islands, the island was well provided with railways ; one of the chief stations on the main line from Bridgetown through the south-east of the island is for Codrington College, the only university in the West Indies.
10. Grenada, St. Vincent, and Tobago—like their neighbour, Barbados—and Antigua, in the exposed north-east, have a specially healthy climate.
1. Grenada is also so free from hurricanes that it is eminently suited for the production of spices and fruit, and it has a snug little harbour in St. George—on its leeward side. It is so healthy that it has a thriving cattle trade.
 2. St. Vincent exports dye-woods, sugar, and arrowroot from Kingston—on its sheltered south-west coast.
 3. Tobago is a forest-clad plain, which produces excellent fruit, arrowroot, and tobacco. Its chief port, Scarborough, is on the east coast, a characteristic position for a harbour that exports coco-nuts.
 4. Antigua, which is covered with sugar and cotton plantations, has a more broken coast than most of the islands, which gives it a large choice of harbours. St. John is the seat of the Governor of the so-called "Leeward Islands," but Falmouth is the best harbour.
 5. The volcanic islands of St. Kitts and Nevis export sugar and sulphur from Basseterre and Charlestown, and Basseterre also collects the salt and phosphates of Anguilla ; and Montserrat exports its famous lime-juice from Plymouth.
 6. The barren St. Thomas has such a central position and such a fine harbour that it has become a great cable and steamer centre, though, like the rest of the Virgin Islands, it is subject to hurricanes and earthquakes.

SOUTH AMERICA.

Introductory.

1. SOUTH AMERICA was in a relatively high state of civilisation when, at the end of the fifteenth century, it was invaded by the Spaniards ; but, until quite recent times, its condition has been one of more or less steady deterioration.

1. The predominant tribes at the time of the Spanish invasion were the Incas of Cuzco and the Araucanians of Chile, with both of whom the Spaniards intermarried.
2. When Pope Alexander VI. divided the world between Spain and Portugal, the latter received the east of Brazil, and proceeded to introduce negro slaves for the manual work ; and even with these the Europeans intermarried.
3. In modern times there has been a steady stream of Italian immigration into the Amazon and the Plate basins, and of Hindu coolies into the Orinoco basin ; and this has caused further intermarriage.

2. After 300 years of grinding tyranny, the Spanish yoke was thrown off at the beginning of the nineteenth century ; and various Federal Republics were formed on the model of the United States.

1. This was an indirect result of the establishment of the Napoleonic Empire in Europe ; and the circumstances under which it took place—added to the deadly racial and personal rivalries which are always the outcome of mixed

marriages—have been mainly responsible for the series of Revolutions proverbially characteristic of the Latin Americans. Cf. p. 196.

Surroundings.

1. In spite of the fact that South America has a very large amount of sea round it, it has a comparatively small proportion of coast to surface.

1. The reason for this is the absence of peninsulas ; and, if it were not for the fiord-system in the south-west, the proportion would be considerably smaller than it is.

2. South America has, however, much more benefit from its surroundings, both commercially and climatically, than the similarly compact continent of Africa.

1. The chief openings which do exist are the mouths of great 'Atlantic' rivers that are navigable far into the interior of the continent ; and between these there are isolated bits of mountainous coast which provide splendid harbours. Thus, a spur of the Andes shuts in the lagoon of Maracaibo between the Magdalena and the Orinoco, and the remains of a huge mountain mass shut in the harbour of Rio de Janeiro between the Amazon and the Plate.

2. Elsewhere, especially in the hottest latitudes, the country is entirely exposed to the full influence of wet winds, including both the S.E. and the N.E. Trades. For instance, the coast-line of the Orinoco and Amazon mouths and the country between them is an absolutely flat mangrove-swamp ; the whole of the 'elbow' of Brazil is bordered only by a sandstone reef ; the 'temperate' coast north of the Plate estuary is a series of lagoons, and south of it a shelf too low to stop any winds from the ocean.

3. Like Africa, South America is remarkably deficient in islands.

1. Except for those off the north coast, which have already been included in the 'West Indies' (cf. p. 202), there is really no island of any importance. The Falklands are of very little commercial or political value, and the great island of Tierra del Fuego is quite valueless.
2. The deeply-indented shores of the Falklands supply several harbours, e.g. Port Stanley, which is a whaling station

and a regular port of call for passenger vessels. As their low elevation, ocean position, and exposure to all winds, give them a very even climate, with constant fogs and little sunshine, their only important products are pasture and peat; and their chief industries are consequently connected with wool and meat.

N.B.—The Chilian island of Juan Fernandez was for several years the home of Alexander Selkirk, the original of 'Robinson Crusoe.'

4. The west coast, north of the useless fiord-system, is steep and almost unbroken.

1. The close proximity of the mountains, however, makes it much more healthy than the east, and their bold headlands shelter a few small but safe bays. This helps to account for the fact that the Spaniards—who conquered from the west, fared better than the Portuguese—who conquered from the east.

N.B.—For details of the east coast, see pp. 230-235.

Surface.

1. The surface of South America resembles generally that of North America. Cf. pp. 125, 130, etc.

1. Both have huge mountains, vast plains, and gigantic rivers; in both cases the largest mountains are in the west, the plains are in the centre, the great rivers flow eastward, and their mouths are separated by smaller mountain masses. Thus, the Rockies, Appalachians, and Laurentians have their counterpart in the Andes, Brazilian, and Guiana Mountains, as the Mississippi and the St. Lawrence have in the Amazon and the Plate.
2. There are, however, three important points of difference:—The northern continent is considerably the larger (as 9 to 7); it stands between considerably smaller areas of water; and it is almost entirely in temperate latitudes, while the mass of the southern continent is in the tropics.
3. The effect of this on South America is threefold:—As the area is more limited, the contrasts are more marked; as so much of it is in the tropics, the heat is very great; and, as it has so much more water round it, its climate is much less 'continental.'

2. South America consists, then, of three mountain-systems,—Andes, Brazil, and Guiana—giving birth to

three river-systems,—Amazon, Plate, and Orinoco—spread over three plain-systems,—Selvas, Pampa, and Llanos.

1. The characteristic of the continent is the very large proportion (nearly half) of it that is less than 600 feet above the sea compared with the relatively large proportion that is more than 10,000 feet.

3. The long chains, or Cordilleras, of the Andes are the backbone of the whole continent.

1. Although not so high as the Himalayas, they are more uniformly high, more unbroken, and three times as long—nearly 5000 miles.
2. From Cape Horn they run for about 2000 miles in a comparatively simple, single line, up to the great westward curve of the coast; from this point they become a double chain, surrounding the Titicaca lake plain; and northward, again, they become a treble chain.
3. Throughout their entire course they rise above the line of perpetual snow in the different latitudes; their actual height varies from about 8000 feet (more than twice Snowdon) in Patagonia to 23,000 feet in the Chilian cone of Aconcagua, a dozen other peaks being about 4 miles high, *e.g.* Sorata and Illimani; and they contain a great number of active volcanoes, *e.g.* Chimborazo (about 20,500 feet) and Cotopaxi (about 19,500), and are the scenes of almost hourly earthquakes.

4. The Eastern Highlands, like the Andes, have a steep seaward face and a much gentler slope inland.
Cf. p. 131.

1. They consist of extremely old rock, which—long before the Andes existed at all—had been 'faulted' into masses of table-shaped mountains; and now, owing to the erosion of running water, they have been divided up into wide river valleys.
2. Owing to the general slope of the plateau, all the longest rivers, except the São Francisco, flow inland as tributaries to the Amazon or the Plate; and none of them, except the Madeira, are of much use for navigation, because they are spoilt by rapids or waterfalls where they tumble over the edge of the plateau.

3. The greatest height—about twice that of Ben Nevis—is in the Serra do Mar.

5. The Northern Highlands, like the Eastern, consist of very old rock 'faulted' into typical table mountains and terraces.

1. They rise to about the same height in the Parime Mountains as the Eastern Highlands do in the Serra do Mar, but their general slope is from west to east.

6. The Central Lowlands may be divided into two areas—the low Patagonian area and the area of the Great River Basins.

1. The Patagonian area includes the Shingle Desert plateau and the southern corner of the Pampa; the River Basins include the rest of the Pampa, the Selvas, and the Llanos.
2. The Llanos are savanas, *i.e.* a link between the rainless deserts into which steppes gradually pass, and the tropical forests which are fed by a constant equatorial rainfall; and their long dry season limits their vegetation to plants which can germinate, grow, and ripen during the short wet season, *i.e.* grasses.
3. The Pampa are of the savanna type, but in temperate latitudes; and they are only dry enough to be treeless, showing their fertility during the dry season in gigantic crops of thistles—always a sign of rich soil. Cf. New Zealand.
4. The Selvas are forest-plains under equatorial heat and rainfall—a huge stretch of dense, dark, damp jungle, under the deep shadow of which the natives are overwhelmed physically and morally amid the mazes of tropical creepers and undergrowth.

7. Thanks to the general low level of the continent (cf. p. 219), the river-system is unique, for there is always communication by water between the Orinoco and the Amazon *via* the Cassiquiare and Rio Negro, and in the wet season there is similar communication between the Amazon and the Plate *via* the Madeira and the Paraguay.

1. Though not the longest river in the world, the Amazon has the largest basin and the greatest volume. Its basin is

nearly as large as Canada, and provides at least 25,000 miles of navigable waterway; in the 1000 miles to the ocean from the confluence of the Marañon—or Upper Amazon—with the Ucayali at Nauta, it falls less than 400 feet, and there is no insurmountable obstacle below the Jaen rapids; the tide is felt certainly as far as Obidos (400 miles), and the river discolours the Atlantic for 200 miles out from its mouth.

N.B.—It should be compared with the Congo, p. 247.

2. The La Plata system has a greater volume than any other river in the world except the Amazon and the Congo, and is very useful to both commerce and agriculture. Unlike the Marañon, however, which rises at a height of over 14,000 feet and falls 10,000 feet in about 100 miles, the Rio Grande, or Upper Parana, rises in the low rain-fed forests behind Rio de Janeiro; but its course over the gentler slope of the Brazil plateau, like the course of its chief tributaries—the Paraguay and the Uruguay—is much interrupted with rapids.

N.B.—Note the number of river-side towns called *Salto* ('jump').

3. The Orinoco is navigable for at least 1000 miles, but is subject to heavy floods; it has formed a large unhealthy delta, and is subject to tidal-bores.

Climate.

1. As the surface of the continent is comparatively uniform, the climate will probably show similar uniformity; and the two determining elements are height and wind.

1. The Andes divide the continent into two areas—a comparatively small Pacific area, dependent for regular rain on west winds; and a much larger Atlantic area, similarly dependent on east winds.
2. The Tropic further divides it into two areas—a Tropical area, two-thirds of the whole, and a Temperate; but the surface of the Tropical area is greatly protected from the sun by dense forest.
3. Consequently, in the east there must be an immense amount of rain brought to the Tropical area by both the Trade winds, though there may be areas of drought outside the Trade-wind influence, *e.g.* the Shingle Desert; and in the

west there must be a considerable amount of rain brought to the Temperate area by the Anti-Trade winds, though there may be areas of drought outside the influence of the Anti-Trade winds, *e.g.* the Desert of Atacama.

N.B.—There are also areas of drought on the plateau *between* the various Andean ranges north of L. Titicaca. Cf. p. 144.

4. This Desert of Atacama is extended southward into 'Temperate' latitudes, mainly owing to the cold Humboldt current, off which evaporation is slow and slight; and, for the same reason, there is a good deal of mist along the west coast in winter. Cf. p. 228.
5. As there is practically nothing to stop the east winds, their influence spreads right across the continent up to the very heart of the mountains, while the west winds are stopped practically on the coast.
6. The influence of the rainfall on the rivers may therefore be further illustrated by the way in which the head-streams of the Amazon basin have cut their way back, *i.e.* westward, while those of Chile have cut their way eastward. In each case this has improved the very difficult communication across the Cordilleras.
7. The climate of the southern peninsula naturally varies very slightly, being always moist and cool; and that of the northern isthmus varies even less, being always moist and hot. Indeed, the climate generally is less continental than that of any equal area in similar latitudes. Cf. § 1 above.

Vegetation and Minerals.

1. With its immense variety of climate and elevation, South America can produce every known plant; but the mass of the country produces grasses and forests.

1. Grass-lands and forest-lands are diametrically opposed to each other, for grasses arrive at maturity more quickly, and trees more slowly, than any other plants. Consequently, grasses are the peculiar product of climates that are subject to great extremes ('steppes') or to long droughts ('savannas'), *e.g.* the llanos of Venezuela, campos of Brazil, pampa of the Plate basin, and steppe of Patagonia; while the forests are the appropriate product of the constant rain and even temperature of the Amazon basin, *e.g.* the Selvas.
2. The link between the two is found in the woods along the rivers in the grass regions, and the 'park' lands between

the Temperate and Tropical belts, *e.g.* the Gran Chaco ('Great Hunting Ground') and the Matto Grosso ('Great Woods').

3. The grass-lands eventually pass into hot and frozen deserts, *e.g.* the Atacama and the Shingle deserts, which produce only dwarf vegetation (cf. p. 144); the forest-lands pass into the densest wet-jungle on the face of the earth, producing all kinds of hard-woods and rubber-creepers.
4. Cacao, tapioca, maté tea, cinchona, maize, tobacco, potatoes are all indigenous plants representing different areas of climate and elevation.
5. Rice, sugar, cotton, and coffee have been introduced by Europeans.

2. The animal life varies, of course, with the climate and vegetation, but most of the useful animals have also been introduced by Europeans.

1. The llama and the alpaca of the Andes are extremely valuable both as wool producers and as beasts of burden in the almost impassable Andean passes; and the Incas protected the birds whose deposits formed the great guano wealth.
2. Horses flourish on the llanos and pampa, and cattle and sheep on the southern grass-lands—the cattle on the wetter and warmer, and the sheep on the drier and colder parts; and pigs are very plentiful, many of them half-wild.

3. The very old rock of the Eastern and Northern Highlands is rich in minerals, especially gold and diamonds; and the Andes also produce gold, copper, and immense quantities of silver.

1. The Guianas were the El Dorado* of the age of Drake; and the famous mines of Potosi have supplied since that age some £300,000,000 worth of silver, and are not yet exhausted.
2. Depôts of salt are common in all the desert and semi-desert regions, *e.g.* the western edge of the Pampa and Atacama; and the latter is also rich in nitrates.
3. The warm shallow waters of the Panama Gulf produce the pearl oyster. Cf. Ceylon.

*The actual legend of 'The Man of Gold' was Colombian.

THE ANDEAN STATES.

1. THIS title is usually taken to exclude Chile, and to apply only to the States which stretch across the Cordilleras within the Tropics and include the Montana, or hilly forest region, along the foot of the eastern slope.

1. All of these States have a large proportion of artificial—and, as a rule, vaguely marked—frontier, which is a constant cause of political trouble.
2. They vary in size from 120,000 square miles in Ecuador (= the United Kingdom) to about 570,000 in Bolivia. Colombia is rather smaller than Bolivia, and Peru is rather smaller than Colombia, while Chile is just half the size of Bolivia.
2. Colombia may be divided into three—with Panama, into four—typical areas, and has four zones of climate.
 1. The three areas are—the great parallel ranges of the Andes, separated by the Cauca and Magdalena valleys ; the selvas of the east and south-east slopes ; and the savannas of the northern plain.
 2. The four typical gradations of climate are—the *Tierra Caliente*, or Tropical climate, of the low plain and the river valleys ; the *Tierra Templada*, or Sub-Tropical climate, of the foothills and upper valleys ; the *Tierra Fria*, or Temperate climate, of the high plateaus ; and the *Paramos*, or Frigid climate, of the mountains. Towards the Trade winds, *i.e.* in the north and the east, there are two wet seasons (April-June and September-December) and two dry seasons ; but elsewhere the year is divided into one long wet season and one dry season.
 3. The vegetation naturally varies with the rainfall and the height. The *Tierra Caliente* produces specially sugar, bananas, and cacao, and great herds of cattle feed over the llanos ; the *Templada* produces specially coffee and maize, the coffee of Antioquia and Santander being particularly good ; the *Fria* produces wheat and fruit, especially round Bogota. Tobacco is becoming an important crop round Ambalena.

4. There is some mining for precious metals (mainly silver) and coal and iron, chiefly in Antioquia, to which there is fairly easy access *via* the Cauca valley; and emeralds of great value are found in Santander.
5. The population is principally concentrated on the healthy plateaus, Medellin having 50,000 and Bogota 120,000 inhabitants; elsewhere only the harbours are important, *e.g.* Panama and Buenaventura, Cartagena and Barranquilla. The last—with its sea-port of Sabanilla or Puerto Colombia—practically monopolises the foreign trade, as the Magdalena is the principal artery of trade, though it is only navigable to Honda.

N.B.—The Atrato is navigable almost up to Lloro, but has to compete with the Colon to Panama railway for the western traffic. This railway also does an entirely foreign, but very valuable, transit trade. Cf. p. 201.

3. Ecuador, which includes politically the Galapagos Islands, may be divided into three areas—the Andes, the Coast, and the Montaña.

1. The Andes form a double chain separated by a very rough and broken plateau; great eruptions have covered the original soil with volcanic soil, and thrown up magnificent peaks, *e.g.* Chimborazo, Cotopaxi, Antisana, and Cayambe; and the river scenery is magnificent.

N.B.—Cotopaxi, though nearly 900 feet lower than Chimborazo, is much the highest *active* volcano in the world.

2. The coast district from the Mira river, which forms a convenient political boundary, down to about Manta is clothed with dense forest; but, with the decrease of rainfall southward, it becomes practically barren. This part is, however, very important, because the Guayas estuary provides an excellent harbour, on the hills to the east of which there are famous cacao plantations.

N.B.—The island of Puna is a great protection to the entrance of the Guayaquil Gulf.

3. The Montana, or forested eastern slope, forms really part of the selvas.
4. After the cacao, the most important products are rubber from the coastal forests, especially round Esmeraldas, and cinchona from the cacao district and from the Loxa forest; but sarsaparilla, coffee, and sugar are also produced, and there are immense herds of cattle on the plateau.
5. The largest town is the useful, but deadly, port of Guayaquil (51,000); the only others of any size are on the healthy

plateau—which is in many places so dry that the cactus is the typical plant—*e.g.* Quito (80,000), Cuença (30,000), and Riobamba (18,000).

6. The Guayas system is navigable for some distance, and there is a little railway from Duran to Chimbo ; but communication generally is absurdly backward. Even on the 'main road' from the capital, Quito, to the chief port, Guayaquil, a mounted postman has been drowned in the mud ; and goods have been more than *five months* in travelling between the two cities, though the distance is not more than that from Glasgow to Manchester.

4. Peru, like Ecuador, may be divided into three distinct areas—Andes, Coast, and Montaña.

1. The Andes system consists of three ranges, of which only the Eastern is properly called 'Andes,'—with long parallel valleys drained northward by the Amazon and various tributaries, *e.g.* Huallaga and Ucayali ; the mountain knot of Cerro de Pasco practically unites the three ranges ; the Puna plateau separates the Western from the Central Cordillera, and the Titicaca plateau separates the Central from the Eastern.
2. The coast strip is a rainless desert ; while the Montaña is, again, part of the Amazonian selvas.
3. The climate depends mainly on height and wind :—the eastern exposure receives the full benefit of the S.E. Trades, while the western is entirely cut off from them ; the Puna and Titicaca plateaus are far above the limit of tree-growth ; while the low coast-strip is terrifically hot, tempered only by constant mists off the cold Humboldt current.
4. Where rivers from the eternal snows of the Andes cross the desert, cotton, sugar, tobacco, and excellent wine are produced ; and immense areas might be brought into cultivation by utilising the inexhaustible supply for irrigation. In the meantime, the only important products of the desert are guano, nitre, and petroleum.

The Andes produce immense quantities of silver and copper ; their valleys are the home of maize and the potato ; and their typical animals, the alpaca and the vicuña, supply beautiful wool.

The Montaña produces cacao, coffee, cinchona, coca, tobacco, and even rubber, the cinchona and the coca being indigenous (cf. 'Peruvian bark').

5. Considering the physical conditions, Peru is wonderfully well provided with means of communication. The produce of the Montaña can be exported by the Amazon and its large tributaries, which are navigable to the very foot of the Andes—not 300 miles from the Pacific; the plateau has navigation on Lake Titicaca, which is half the size of Lake Ontario, as well as a railway from Puno to Cuzco; and the coast is already joined to the plateau by two 'Railways in the Clouds'—one from Mollendo to Puno, crossing the Arequipa Pass at a height of 14,660 feet, and the other from Lima to Cerro Pasco (via Tarma), tunnelling the Andes near Oroya at a height of 15,645 feet.
6. There are a number of small ports, *e.g.* Payta, Eten, Huan-chaco, Salaverry, Chimbote, Pisco, Mollendo, Arica—joined by rail to provincial capitals; but by far the most important harbour is the foetid hovel of Callao, and the most important of the capitals are Lima, Arequipa, and the famous wine centre of Yoa.

Of the inland towns, the old Inca capital of Cuzco, on its mountain-girt plateau at the foot of the renowned Sacsahuaman Hill, was a much more appropriate place for a capital than the fever-haunted desert of Lima is; Pasco and Puno are the two great silver (and copper) centres; and Iquitos is a centre of river navigation.

5. Bolivia, since it lost its small piece of coast-line by the war with Chili in 1883, may be divided into four areas—plateau, cordillera, chaco, and selvas.

1. The plateau contains the silver towns of Potosi and Oruro; its salt soil affords good pasture for llamas and sheep, as well as the natural home of the potato; and it has railway communication from Oruro to the Chile port of Antofagasta, and from La Paz—*via* the Titicaca Lake—to the Peru port of Mollendo.

N.B.—Owing to the rapid evaporation, the heavy silt, and the drain of water by the Desaguadero ('Drain') into salt marshes, Lake Titicaca is gradually disappearing.

2. The Cordillera contains the magnificent peaks of Sorata and Illimani, and has access by its valleys or 'Yungus' to the selvas of the Madeira basin. These valleys are rich in cinchona, cacao, coffee, and coca; and the selvas themselves export rubber. Cochabamba, the depot for nearly all these products, has a delightful climate high up on the eastern slope of the Cordillera, and commands one of the 'Yungus,' as Santa Cruz does farther eastward.

3. Sucre, the political capital, stands on the water-parting between the Madeira and the Paraguay, in a central position, which made it an appropriate site for a University, and a railway could easily be constructed along the Pilcomayo valley; Tarija, like Cochabamba, has a delightful climate, and commands a ravine down to the savannas of the Gran Chaco.

CHILE.

1. CHILE slopes rapidly from the Cordillera to the Pacific, and gently from north to south.

- 1 This general slope from north to south has resulted in the partial submersion of the southern extremity, the valleys reappearing as fiords and the higher lands as a series of islands—a great contrast to the simple unbroken coast north of Chiloe Island.
2. The Andes rise in Aconcagua to the extreme height of over 23,000 feet (seven times the height of Snowdon); and there is a lower and older line of mountains just along the coast, forming with the Cordillera the fertile 'Central Valley'—an alluvial plain 30 miles wide and 500 miles long.
3. In the neighbourhood of the Capricorn Calms there are naturally no regular winds to carry moisture inland, though clouds and mist are very common off the coast; within the influence of the S.W. Anti- Trades there is a constant rainfall, especially in the latitudes of the 'Roaring Forties'; the Central Valley has a beautiful climate, protected from the wet winds by the coast range, magnificently watered from the Andean snows, and with a slope that makes drainage and sanitation perfect; and the temperature everywhere is lowered by the proximity to the cold Humboldt Current.
4. The distribution of population depends on the division of the country into three areas—Southern, Central, and Northern. In the Southern, *i.e.* the 700 or 800 miles from Tierra del Fuego to Valdivia, the snow-covered precipices, with their glacier-girt fiords, can support only a few hunters, shepherds, and fishermen; in the Northern, *i.e.* the 700 or 800 miles from Coquimbo to the Peru frontier, the rainless desert has no attraction for population except the deposits of nitrates

and guano. Thus, Punta Arenas—an old convict station—is a port of call; Iquique is a nitrate-port, Caldera a silver-port, Antofagasta a guano-port, and Copiapo and Tacna are little mining centres.

5. The Central division concentrates all the population and wealth of the country in agriculture (wheat and vine) on the plain, pasture on the slopes, and copper-mining in the heights and along the coast. The capital of Santiago, round the rocky height of Santa Lucia, commands the agriculture and commerce of the Great Central Valley, and is joined by rail—*via* the important junction of San Felipe—both with Concepcion and with its special harbour of Valparaiso. Talca and Chillan, higher up the line, are cattle centres.

Concepcion stands at the mouth of the longest river in Chile, the Biobio, close to a useful coalfield, and has a coastal trade with Valdivia, Puerto Montt, and the Chiloe coalfields. Coquimbo has a position of similar importance at the other end of the Central District, being the port of La Serena, a town of great mineral wealth, with a climate which corresponds to its name, and which is responsible for the very beautiful honey. Cf. Chamouni and the various honey-centres on the edge of the Californian desert.

Valparaiso is, however, the most important harbour, being more central than Concepcion and having much better communication inland, the railway to San Felipe piercing the Andes—just south of Aconcagua—by the longest tunnel in America into the Argentine Republic.

THE ATLANTIC STATES.

1. THE Atlantic area is enormously larger than the Pacific area, and the political and commercial importance of it is very great.

1. The States vary in size from about 31,000 square miles (= Ireland) in French Guiana to 3,210,000 in Brazil (larger than the U.S.A.); Dutch Guiana is half as large again as French Guiana, and Uruguay is as large as both put together; British Guiana is rather smaller, and Paraguay is rather larger, than the United Kingdom; Venezuela is just five times the size of the United Kingdom, and the Argentine is three times as large as Venezuela.

2. The Argentine or Silver, Republic is a huge broken plain backed by 2,500 miles of lofty mountains.

1. About half the total area belongs to the basin of the Plate, or Silver, river, which has given the country its alternative title; and the whole may be divided into four areas—the tropical Chaco, the temperate Pampa, the arid Patagonian steppe, and the mountain zone.

N.B.—There is practically *no* silver in the Plate basin.

2. The Chaco has a tropical climate even outside the Tropics except where it slopes up to the Andes; and, as it is well watered, it is very prolific. The unreclaimed land is largely covered with forests and tropical undergrowth; the cultivated land produces maize, tobacco, and sugar-cane, with coffee on the western hills. Thus, Tucuman specialises in sugar, while Salta and Jujuy also grow coffee; the Misiones district produces the valuable Yerba-maté tea.
3. The Pampa grass-lands are much the most valuable part of the country at present. They are so flat that for hundreds of miles the railways need neither an embankment a yard high nor a cutting a yard deep; the natural grass feeds enormous flocks and herds; and every year more of the pasture is being put under the plough—for maize, wheat, and flax—which will increase the small (though fairly regular) rainfall.
4. The Andean slopes, of course, give great variety of height and climate; but the dry heat of their lower slopes is specially suited to the vine, *e.g.* round Mendoza. The Patagonian steppe, on the other hand, is monotonously arid, tempered only by the nearness to the Atlantic.

N.B.—The volcanic dust along the base of the Andes is often carried north-eastward by the 'Pampero' wind and causes great discomfort.

5. The level surface of the eastern and central parts has led to a great development of railways, as well as to a considerable uniformity of temperate climate. All the chief provincial towns have been thus brought into touch with Buenos Aires, and every encouragement given to mining—especially for copper—and agriculture. The rivers are also extremely valuable for transport; the Parana is navigable for small vessels for considerably over 1200 miles, and both the Paraguay and the Salado are navigable for several hundred miles. Consequently, the combination of river and rail transport has given special importance to the littoral towns, *i.e.* those on the sea coast or along the great rivers.

6. Of these littoral towns, by far the most important is Buenos Aires, the largest city in the southern hemisphere. As its name implies, it has wonderfully 'good air'; energetic engineering has enabled it to keep ahead of its outport, La Plata, as a harbour (cf. p. 69); and its railway facilities are perfect. It has no rival; but the small riverside railway-junctions of Rosario, Sante Fé, Parana, and Corrientes have a busy trade in pastoral and agricultural products.

N.B.—Though there is useful shelter along the coast, *e.g.* the San Matias Gulf, there is practically no natural harbour; and one of the best, Bahia Blanca, has been made into a naval station.

7. Of the inland towns, Cordoba, San Luis, and Santiago are agricultural and pastoral markets on the great trunk railways, about the centre of the provinces from which they take their names; and nearly all the Andean towns are famous for vineyards and mining, *e.g.* Mendoza, San Juan, La Rioja, and Catamarca.

3. Uruguay is an extremely fertile little peninsula divided into two areas by the Rio Negro.

1. The north and east rise to the Brazil plateau, while the south and west are rich undulating pampa. The nearness to the sea and the latitude guarantee a warm even climate; but the elevation is too low for a heavy rainfall, and trees are not common.
2. The richness of the pampa is due to the amount of phosphates and alkaline silicates in the soil, and it makes the pasture more suitable for cattle than for sheep. Indeed, the cattle industry is so important that almost nothing else is done. The chief 'saladero' or slaughtering centres are Paysandu and Montevideo; the chief meat-extract factories, *e.g.* Liebig's, are at Fray Bentos.
3. The Uruguay makes a convenient political boundary, and most of the traffic from Colonia, Fray Bentos, and Paysandu is done by river; but the cascade at Salto stops continuous navigation farther up stream, and there is a great deficiency of railway transport, except between the capital and chief harbour of Montevideo and the chief inland town of San Jose.

N.B.—With the extensive works now in construction, Montevideo may be made into a really useful harbour.

4. Although now entirely an inland state, Paraguay has convenient political boundaries in the Parana, Paraguay, and Pilcomayo.

1. The Parana is much the largest, but is spoilt for continuous navigation by the cataract of La Guayra; most of the commerce of the country is done by the Paraguay, and nearly all the upland towns are along its banks, *e.g.* Villa Real and Concepcion.
2. There are three natural divisions—the dense and largely unexplored forest of the Gran Chaco, subject to constant floods from the Pilcomayo and producing quantities of valuable timber, rubber, and the native yerba-maté; the hills which rise in the north-east up to the Brazil plateau; and the low fertile ‘peninsula’ south of Villa Rica—the ‘Mesopotamia of South America’ (cf. ‘the ‘Entre Rios’ district of the Argentine).
3. This southern ‘peninsula’ contains the only large towns, Asuncion (the capital) and Villa Rica, joined by a railway, on which poor people may travel *free* (in an open truck); but most of its valuable agricultural products are exported directly from little riverside ports like Itapua, and reach Europe as ‘Plate’ tobacco, oranges, maté, etc.

N.B.—The oranges are unique in size and flavour, and the amount of tobacco consumed locally in the shape of cigars—by men, women, and children—is quite phenomenal. Cf. Siam.

5. Brazil consists of a huge ‘island’ plateau, and the continuous surrounding valleys of the Amazon-Madeira-Guaporé and the Parana-Paraguay-Jauru.

1. The whole area is larger than Australia or U.S.A., and the longest general slope is from the sea range behind Rio de Janeiro over towards the low vague waterparting between the Guaporé and the Jauru, the plateau having also lateral slopes down to the equator and the tropic.
2. The whole area may also be roughly divided into campos or plateau and selvas or valley; and, as the rainfall is very heavy and the temperature extreme, forests are common everywhere, and the lower valleys are covered with dense jungle.

N.B.—The jungle products are specially rubber and ‘Brazil nuts,’ while those of the coastal forests are specially rose-wood and coffee.

3. Again, the whole area may be divided into three important river-systems—the selvas of the Amazon, the mining district of the São Francisco, and the ‘Plate’ or sub-tropical agricultural area between the Atlantic and the Paraguay.

4. The mineral wealth of the Minas Geraes ('Many Mines'), part of the S. Francisco basin, with such suggestive names as Diamantina and Ouro Preto ('Black Gold') or Villa Rica, has led to the construction of railways inland, especially the extension of the 'coffee' railways from Rio de Janeiro and Santos.
5. The Amazon valley has two natural centres—Manoas, near the confluence of the great upper tributaries, and Belem (or Para), on the part of the Para (or Tocantins) estuary which is used as the chief commercial entrance to the Amazon.
6. The southern sub-tropical and temperate region is the most important politically (owing to the better climate) and agriculturally. Not only does it contain the capital and chief harbour of Rio de Janeiro, the subordinate but important harbour of Santos, and the dense population of the less tropical states; but also most of the mineral wealth of the upper São Francisco basin is exported through it. Rio itself has a magnificent harbour; Santos exports coffee from the very rich plantations round São Paulo; Paranagua, as its name implies, exports the products of the Parana basin, especially maté; and Rio Grande do Sul exports the cattle of the great pasture lands behind the Mirim and Patos lagoons, especially round Porto Alegre.

N.B.—Rio de Janeiro owes its name to the fact that it was discovered on January 1st. Cf. *Natal*, near C. Roque, which was discovered on Christmas Day (*Dies Natalis*).

7. The excessively unhealthy character of the tropical coast, especially along the river deltas, is brought out by a comparison of the population of an exceptionally important place like Belem (only 65,000) with towns like Bahia (175,000) and Pernambuco (120,000), which have no natural waterway inland. Pernambuco is simply a roadstead made into a harbour by the 'Reef' to which it owes its alternative title of '*Recife*'; and the shore of the 'Bay' or *Bahia* is so steep that there are hydraulic lifts in the streets. Both towns export sugar, cotton, and tobacco, as well as some coffee.
6. British Guiana, like British Honduras (cf. p. 198), consists of a low swampy plain along the sea and forest-clad mountains inland.
 1. As the coast lands are practically made of mud brought down by the Orinoco and the Essequibo, and have intense tropical heat and a very heavy rainfall, they are extremely fertile,

and produce enormous crops of sugar-cane. Indeed, both Georgetown and New Amsterdam owe their importance almost entirely to the sugar trade; and the former has given the name of its river—Demerara—to a particular kind of sugar.

2. There are two wet seasons—December to February and June to August—and the extreme humidity of the climate greatly increases the amount of rum that can be made from the sugar. Cf. p. 214.
3. The wooded hills inland are an ideal site for coffee, and the forests supply all the most valuable kinds of tropical timber.

7. Dutch Guiana is simply a reproduction of British Guiana on a smaller scale.

1. It is often called Surinam, from its central river, the mouth of which is a suitable place for the commercial and political capital of Paramaribo.
2. Unsuccessful competition with the Demerara district has led to sugar being replaced by cacao and coffee.

8. French Guiana differs only from its neighbours in having a smaller area, a higher coast, and a viler climate.

1. St. Louis, the capital and the only town, is on the mud bank of Cayenne, which has given its name to the red pepper grown in the neighbourhood.

N.B.—The Oyapok, Maroni, and Corentyne are convenient political boundaries.

9. Venezuela may be divided into three areas—the Orinoco plain, the Maracaibo basin, and the mountains between the two.

1. The Orinoco 'plain' includes the densely forested edge of the Guiana plateau and the Cordillera, which accounts for the number of cataracts and narrows in the river-system; but it is mainly occupied with the llanos. The products are cattle from the llanos, gold from the Callao district, and drugs (*e.g.* sarsaparilla) and cabinet timber from the plateau; the only town is Bolivar—formerly Angostura ('The Narrows').

2. As the climate of the Maracaibo basin varies from one of perpetual snow on the Sierra Nevada ('Snow Ridge') behind Merida, to one of equatorial heat on the sheltered shore, this basin can produce all kinds of vegetation ; but coffee and cacao are the most important, and are exported mainly from San Cristobal and Valera *via* Maracaibo. This port is decreasing in importance, however, as the lake is cut off from the Venezuelan Gulf by a bad bar, and is being silted up.
3. The mountain district between the two is the healthiest, and therefore the most populous, part of the country ; and where the wet winds are entirely cut off from a low level area, *e.g.* west of Coro and south-west of Maturin, there are even areas of desert, with cactus and thorn. Consequently, all the important towns are up amongst the hills, with little railways down to their seaports. Thus, the capital of Caracas exports its supremely good cacao from La Guayra, Valencia exports its cacao and coffee from Puerto Cabello, and Aroa exports its copper from Tucacas.

AFRICA.

Introductory.

1. AFRICA is part of the "Old World," and was the scene of some of the earliest civilisations; but it has been so little known until within the last twenty years that it is appropriately called "The Dark Continent."

1. Its geographical conditions have been a tremendous obstacle to its exploration.
2. All its natives are more or less dark-skinned, and it is the home of the Black Man.
3. It is shrouded in moral darkness; for it is the land of the slave-dealer, the fetich, and the human sacrifice.

2. Many of the chief features of the continent were known to Ptolemy (A.D. 150) and even to Herodotus (B.C. 450), and the Portuguese pioneers paved the way for further knowledge by their discovery and partial settlement of the Cape at the end of the fifteenth century.

1. Bartholomew Diaz discovered the Cape of Good Hope—or Cape of Storms, as he called it—in 1487, and Vasco da Gama discovered the Cape route to India in 1497.

N.B.—The number of islands and bays called after saints is due to the good old custom of giving to places the names of the saints on whose festivals they were discovered. Cf. the coast of South America.

3. The scientific exploration was begun by Bruce towards the end of the eighteenth century by his famous expedition to the sources of the Blue Nile, and falls roughly into three epochs—

1. The Niger problem, with which are associated the names of Mungo Park and Clapperton (1778-1830);
2. The Nile and Zambesi problems, associated specially with the names of Livingstone, Burton, Speke, and Baker (1850-1862);
3. The Congo problem, solved by Stanley in a single journey (1874-77).

N.B.—The northern and southern portions of Equatorial Africa became connected with each other through (2), and the eastern and western portions through (3).

General Surroundings.

1. The fact that Africa is surrounded by sea everywhere ought to have a very beneficial effect on its climate, commerce, and defence; but it has less benefit from its surroundings than any other continent on the face of the earth.

1. Its coast has very few commercial advantages;—the Red Sea is very narrow, and has little or no effect on the climate; and the latitude largely counteracts the few advantages which do exist.

2. Owing to the extraordinary simplicity of its outline, Africa has less coast in proportion to its size than any other continent, the interior enjoying neither the commercial nor the climatic advantages of the sea.

1. For instance, North America has twice, and Europe has three times, as much in proportion to their size. Indeed, Europe has actually some 3000 miles more coast than Africa, though the latter is three times as large as the former.
2. The double Sidra-Gabes and Benin-Biafra gulfs are really not exceptions to this general rule, nor are the isolated inlets such as Delagoa Bay, Walvisch Bay, and False Bay. For the Sidra-Gabes recess, the ancient Syrtes or quick-

sands, has almost no value for commerce, and is backed by the Sahara; while the division of the Gulf of Guinea into two is merely a nominal division caused by the protrusion of the Niger Delta.

3. The want of bays, gulfs, and inland seas, is not the only disadvantage of the coast; disease and deserts are still more formidable.

1. For hundreds of miles along the west coast north of Cape Blanco, and along the east coast between Cape Guardafui and Suez, the shore breaks immediately on to desert; while for hundreds of miles along the west coast between Cape Verde and Cape Frio, and along the east coast north of Cape Corientes, the flat marshy shore is a hot-bed of disease and death.
2. Where climate and coast are most favourable, as in the extreme south-west and the extreme north-west, communication inland is seriously hampered by mountains, *e.g.* the Atlas.
3. At the other two points where Africa comes nearest to its neighbours, the Isthmus of Suez and the Bab-el-Mandeb Straits, it faces only desert. These two points, however, like the Straits of Gibraltar, mark the natural connection of Africa with the Old World; for, while the Mediterranean and the Red Sea are comparatively shallow and narrow, broad and deep oceans wash Africa everywhere else.

N.B.—The Straits of Gibraltar are 8 miles wide, and the Bab-el-Mandeb are 20 miles.

4. The coast of Africa is also remarkably deficient in islands; and those which really belong to the continent are of little value.

1. The only large island is Madagascar, which is separated from the mainland by the 250 miles of the deep Mozambique Channel.
2. The small islands, almost all of which are of volcanic origin, are either in groups—the Canary, Cape Verde, and Comoro Islands—or isolated, like Ascension, St. Helena, and Sokotra.
3. There are a number of islets along the coast of the Red Sea; but the only important African islands that are really continental are Sokotra, Fernando Po, and Zanzibar. The distance from the mainland and the depth of the inter-

vening sea make even the Canaries really oceanic islands, and the Azores and Mascarenhas have practically nothing to do with Africa at all.

N.B.—These outlying islands were, however, of very great use to the early explorers as bases of operations.

5. Again, the winds and currents are not very favourable; the most regular winds blow on the Atlantic over a cold current and away from land, while the winds that blow landward over warm currents (especially the Mozambique current) are the least regular.

1. Off the west coast there is the cold Benguela current, and the westward course of the Trades carries them seaward towards the Equator; but, even, if they blew shoreward, they would carry very little moisture off the cold current.
2. Off the east coast both the northward and the southward currents are warm, and the westward course of the Trades does carry them shoreward; but the S.E. Trades are terribly checked by the great height and length of the Madagascar Mountains, and the N.E. Trades blow for only half the year.
3. In the summer the intense heat of the Sahara draws the 'Etesian' winds inland from the Mediterranean, and S.W. monsoons inland from the Gulf of Guinea; but the Mediterranean is too narrow to saturate any winds that pass over it, and the monsoons blow partly off the cold Benguela current.

N.B.—It is the meeting of this cold current with the warm Agulhas current that causes the frequent fogs and storms off the Cape of Good Hope, which was originally called the Cape of Storms. Cf. pp. 51, 169, and 236.

General Surface.

1. Africa is an enormous plateau divided into two parts by the Equator, very much as India is divided by the Tropic of Cancer.

1. As in India, the shape of the country makes the northern half larger than the southern.

2. As in India, too, the northern half is an oblong running east and west, and the southern half is a triangle running north and south.
 3. As in India, again, the northern or continental half is lower, drier, and hotter than the southern or peninsular half.
2. Not only is the whole continent an enormous plateau, but it is essentially a continent of plateaus.
1. There are no huge low plains or high mountain ranges, like those of Asia and America, but the whole mass has a more or less uniformly high level, rising suddenly from the coast in terraces to a saucer-shaped depression inland.
 2. The plateaus are higher in the east than in the west, reaching in Kilima Njaro and Kenia a height of 18,000 to 19,000 feet, *i.e.* half a dozen times as high as Helvellyn or Ben Lomond. This eastern ridge of the plateau consists mainly of very old rock, and may be called the backbone of the continent.
 3. As has been said, the north is lower, drier, and hotter than the south.
1. The isolated Atlas Mountains in the north-west rise to a height of 12,000 to 14,000 feet, *i.e.* four times as high as Helvellyn or Ben Lomond ; but elsewhere the plateau level is broken only by a few comparatively low ranges running across it from the south.
 2. The most important of these low ranges are the Tibesti, which runs up to the oasis of Ghat—the ranges which skirt the Red Sea—and those which shut in the two banks of the Niger.
 3. Shut in between the Atlas and these spurs from the southern plateau is the huge Sahara Desert, which is very nearly as large as Europe ; and in the south between the two central spurs, where the desert merges in the narrower and better-watered peninsula, there is the inland basin of Lake Chad.
 4. The longest slope of the southern half, like that of the northern, is from the south-east down to the north-west ; but such a huge mass can hardly be expected to have a single general slope.
1. The Kamerun, like the Atlas, is an isolated height in the north-west ; the Zambesi, like the Niger, empties towards

the south-east ; and the water-parting between the Congo and the Zambesi is as vague as that between the Nile and the Shari.

5. The eastern portion of the peninsula is, however, distinctly the higher, and has a very marked character.

1. Its highest ridge runs almost due north and south, following a line of volcanoes, extinct and active, the chief peaks of which are those of Kilima Njaro and Kenia ; and there is a similar ridge farther west, the highest peak of which is Ruwenzori (16,700 feet).
2. Between each ridge and the general surface of the intervening plateau there is a corresponding line of deep valley, which is even continued beyond the Red Sea in the Gulf of Akaba and the Jordan valley.
3. The whole area between the ridges is full of lakes, some of which are broad, like the sea of Galilee, *e.g.* Victoria Nyanza and Lake Tsana, whilst others are long and narrow, like the Dead Sea, *e.g.* Lake Nyasa and Lake Tanganyika.

6. The western half of the peninsula is almost entirely occupied by the huge basin of the Congo.

1. This basin, like that of Lake Chad, is one of the typical saucer-shaped depressions of Africa ; and it is enclosed almost everywhere by the typical plateau rim.
2. The basin extends on both sides of the Equator, and owes its volume of water partly to the narrowness of the peninsula in the latitude of Zanzibar, *i.e.* the point to which the N.E. Trades reach in winter. Cf. pp. 246, 247.
3. From the southern limit of the basin the plateau-level extends practically to the south of the continent.

7. The presence of mountains on or near the edge of the plateau has greatly affected both climate and inland communication.

1. All the mountains have comparatively heavy rainfall on their seaward slopes, and prevent rain from being carried inland ; all the rivers are spoilt by cataracts, many also by steep banks ; and the difficulties of river navigation increase the need for railways, to the construction of which the mountain rim is a great obstacle.

N.B.—The coastal strip is seldom more than 300 miles in width, and generally very much less.

Mountains.

1. There are three distinct mountain systems in Africa—the East Coast, the West Coast, and the Atlas.

1. Like the mountains of Australia, they all run along the coast.
2. Like the Australian mountains, too, they rise abruptly from the coast and break off inland on to great plateaus.
3. And like the Australian mountains, again, but unlike the mountains of the rest of the Old World, they run north and south, not east and west.

2. The Atlas Mountains fill up the whole of North-west Africa between the ocean and the desert, from the mouth of the Draa to Cape Bon.

1. Like the other African systems, the Atlas rises abruptly from the sea, and sinks gradually inland—to the plateau of the Sahara ; and, like the East Equatorial Range, it runs in parallel lines with lakes between. But there are some marked differences between its western and eastern portions.
2. The western portion, which is generally known as the Great Atlas, is confined to Morocco, and is a real mountain range. It is much the highest part of the whole system, having for a considerable distance a height of from 10,000 to 13,000 feet, and the highest peaks, Aiashi and Tamjurt, are probably over 14,000 feet, *i.e.* four times as high as Snowdon. It is thus a great obstacle to the passage of wet winds inland ; and such winds as do penetrate through the lower passes, *e.g.* the Telremt (about 7000 feet high), have still to face the parallel chain of the Anti-Atlas.
3. The eastern portion, which extends through Algeria and Tunis, is really a plateau with high buttresses along its northern and southern edges. The northern buttress, or Maritime Atlas, is sometimes included in the 'Tell' of Algeria, and is crossed by fertile valleys ; it varies in height from about 7500 feet in the west, *e.g.* the Jurjura peaks, to 6000 in the east, *e.g.* the Setif peaks. The Halfa Steppe, or plateau between the two buttresses, is covered with salt lakes called Shotts ; and similar lakes occur again on the landward side of the southern buttress, or Saharan Atlas, which is even higher than the northern one.

N.B.—In Tunis the plateau gradually sinks eastward until only the two buttresses remain in the capes of Blanco and Bon.

3. The West Coast Range consists of three detached and discontinuous sections—the Southern, the Central, and the Northern.

1. The Northern section consists of the Futa-Jallon Highlands, which are simply the steep face or buttress of the plateau—so steep that from the sea they have the appearance of a mountain range, though they are no higher than Ben Nevis.
2. The Southern section consists of the Lower Guinea Highlands, of which the Serra do Crystal is the most marked; and these, like the Northern, are simply the steep outer edge or escarpment of the plateau, though they are a little higher than the Northern.
3. Mount Kamerun is an isolated peak, 13,000 feet high, and belongs to a volcanic chain, the other summits of which appear as islands, *e.g.* Fernando Po, Prince's Island, St. Thomas.

4. The East Coast Range is by far the most important; it consists, like the West Coast Range, of three detached and discontinuous sections—the Southern, the Central, and the Northern.

1. The Southern section runs from Cape Town to the Limpopo under various names, *e.g.* Nieuw-veld, Sneeuw-Berge, Storm-Berge, Draken-Berge; and it varies in height from about 6000 feet in the Nieuw-veld to nearly 8000 feet in the Sneeuw-Berge (Compass Berg = 7800), and about 11,000 feet in the Draken-Berge (Mont aux Sources, 11,150 feet).
2. The Central section consists of the eastern buttresses of the East Equatorial plateau, and its characteristic feature is the series of huge volcanic peaks which overlook the Great Lakes at a height of 16,000 to 19,000 feet, *e.g.* Ruwenzori, Kilima Njaro, and Kenia.
3. The Northern or Abyssinian section has no peaks above 15,000 feet, but no other equal area in Africa has such a great average height as Abyssinia.

5. The longest and most important part of the Southern system is the Draken-Berge, which cuts off from the sea the great pastoral plateau of the Vaal basin; but the broadest part is the triple range

which runs through Cape Colony, and contains the pastoral plateau of the Great Karroo.

1. The whole system rises abruptly from the coast, and sinks gradually inland ; and the height of the mountains and their nearness to the sea cause the precipitation of rain to be very sudden and violent on the seaward slopes.
2. Consequently, the seaward rivers, *e.g.* the Tugela and the Gamtoos, compared with the inland rivers, *e.g.* the Orange and the Vaal, are short and rapid and subject to sudden and dangerous floods ; and the most important of each class, the Orange and the Tugela, rise on opposite sides of the crest of the system in Mont aux Sources and Mount Cathkin.
3. As the system is not strictly continuous, the gaps have been extremely useful for communication inland. For instance, the main line of rail from Cape Town to Kimberley and Bulawayo creeps between the Nieuw-veld and the Sneeuw-Berge ; that from Durban and Pietermaritzburg to Pretoria creeps between the Draken-Berge proper and the Rand-Berge.

6. The Central or East Equatorial section contains the highest peaks on the continent and nearly all the Great Lakes, and consists mainly of two parallel lines of volcanic heights and lake-filled valleys.

1. It stretches from the Zambesi to the borders of Abyssinia, and is in the shape of a catapult ; the handle is the Livingstone Mountains, the right fork extends along the line of Kilima Njaro and Kenia, and the left fork along the line of Mfumbiro and Ruwenzori.
2. On the east side the system rises in abrupt terraces from the coastal plain, only to fall abruptly into the deep trough marked by the long narrow lakes of Eyassi, Baringo, and Rudolf ; on the west side it rises much more gradually, but only again to fall abruptly into the deep trough marked by the long narrow lakes of Rukwa, Tanganyika, and Albert Nyanza.
3. Both troughs converge on the long narrow Nyasa, which lies parallel to the 'catapult-handle' of the Livingstone Mountains ; and the character of the ground between them is marked by the broad Victoria Nyanza.

N.B.—*Nyassa* means 'water.'

7. The Abyssinian system, like the other two systems, rises abruptly from the coastal plain, and falls gradually inland.

1. The seaward face is in two terraces, the lower of which is simply the precipitous outer edge of the plateau—from 6000 to 8000 feet high ; and from the plateau itself the two mountain groups of Simen and Gojam rise abruptly another 6000 feet, and overhang the broad shallow trough marked by Lake Tsana. As the snow-line in the latitude of Abyssinia is only 13,000 feet, the chief peaks, *e.g.* Ras Dajan and Abba Yared, are quite high enough to have reservoirs of snow from which to feed the Atbara and Blue Nile for at least eight months in the year.

N.B.—The line of mountains is continued northward at a much lower height in the Coastal Range above the Red Sea.

Rivers.

1. The rivers of a continent have, of course, a very close connection with its mountain systems.

1. On the one hand, the distribution of the great land masses is practically the key to the watersheds of the continent ; and, on the other hand, the course of the rivers is practically the key to the general configuration of the land.

2. The African rivers fall into two classes—coastal and continental.

1. The coastal rivers are those that rise on the steep seaward slope of the huge plateau-formation of the continent ; and, as the slope is almost everywhere very near to the sea, they are generally too short and far too rapid for navigation.
2. The continental rivers are those that rise on the landward slope of the mountains which buttress the plateau ; and, as this slope is almost everywhere very slight, they are generally very much longer than the coastal rivers, and extremely valuable for navigation.
3. The nearness of their watershed to the sea causes the coastal rivers also to flood so suddenly and violently that they plough very deep channels, which greatly lessens their value for irrigation ; and the difficulty of cutting through the mountain rim to the sea causes the continental rivers to be terribly obstructed by falls and rapids.

3. The continental rivers may be subdivided into two further classes—oceanic and inland; and this subdivision depends more or less upon the character of the watershed.

1. The western watershed has a very much heavier rainfall than any other part of the continent, and the eastern practically monopolises the 'perpetual snow'; while the centre of the continent has no snow and little rain.
2. The only important inland basin is that of Lake Chad; and, of the important oceanic rivers, the Niger and the Zambesi proper are entirely rain fed.
3. The difficulty of cutting through the mountainous rim of the plateau generally causes the oceanic rivers to make a very circuitous course, like the Niger, or to empty on the side of the continent opposite to their source, like the Zambesi, or to do both, like the Congo.

4. The whole river system can, therefore, be arranged under three oceanic and three inland drainage areas.

1. The oceanic areas take their names from the Atlantic, the Mediterranean, and the Indian Ocean, and the inland areas from the Sahara, the Kalahari Desert, and the Eastern Horn.
2. The three oceanic areas, as represented by the Nile, the Congo, and the Zambesi, all have their chief sources in the narrowest part of tropical Africa, *i.e.* the only part of the continent which has mountains over 15,000 feet high, and into which Trade Winds blow.

N.B.—A few lofty peaks are, however, less important than a general ridge elevation.

3. In Africa, as in Europe and the Americas, the Atlantic area is enormously the most important. Indeed, about half the land in the whole world drains into the Atlantic.

5. Not only is the Atlantic area by far the most important, but it also has very typical rivers of each kind. For instance:

1. Outside the Tropics in the extreme north, the Draa is a typical desert torrent, running dry except when the snows on the Atlas are melting; while outside the Tropics in the extreme south, the Orange is a typical semi-desert river,

and, like the Nile, loses so much water by evaporation and absorption that it actually decreases in volume as it approaches the sea.

2. Between the Tropics there are hundreds of typical coastal rivers, especially along the Grain and Ivory coasts; and there are also, on the curious low plain of Senegambia, the only real lowland rivers of Africa, the Senegal and the Gambia.
3. Round the Gulf of Guinea there are several rivers which combine the features of both the coastal and the continental types, *e.g.* the Volta, the Ogowe, and the Kwanza.

6. The four principal rivers of Africa are the Congo, the Nile, the Niger, and the Zambesi.

1. The Congo is the most important in every respect except length; and, in regard to the area of its basin and the volume of its water, it is surpassed by no other river in the world except the Amazon. Cf. p. 220.
2. The Nile, with its 4000 miles, is 1000 miles longer than the Congo, and second only to the Mississippi-Missouri amongst the rivers of the world. Cf. p. 138.
3. The Niger is nearly as long as the Congo, and comes next to it amongst African rivers for volume of water; while the Zambesi is only half the length of the Nile, but also ranks above it for volume.

7. The Congo, like the Amazon, has a large basin which includes an area of constant equatorial rainfall.

1. No other rivers in the world combine these two advantages. In each case the great area of the basin gives room for a huge number of tributaries. In each case, too, the constant heavy rainfall accounts for the enormous volume of water. Cf. p. 241.

8. The Congo basin contains a wide depression which stretches along the Equator for several hundred miles west of the Stanley Falls, and is encircled by a higher level of the great plateau.

1. This depression is the bed of an old lake or inland sea, the shores of which are represented by the rim of the plateau; and it was the tremendous weight of the water thus enclosed that enabled the 'Congo' to originally break through the rim on the west at its lowest point.

2. The rivers which originally fed this sea, now form a number of parallel tributaries of the Congo; and all of them are obstructed by falls and rapids where they tumble over the old shore-rim. Thus the Kwango, Kassai, Lulua, Sankuru, and Lomami, all run northward parallel to each other, and all are obstructed by falls and rapids about latitude 5° S

9. The Upper Congo is known by various names.

1. The main stream, under the name of Chambezi, rises south of lake Tanganyika, and descends gradually to the south-west, but is diverted into Lake Bangweolo by the Lokinga Mountains. Issuing from Lake Bangweolo as the Luapula, it turns due north, and passes through Lake Mweru to join the Lualaba. Then it flows on north under the name of the Lualaba to the important Arab mart of Nyangwe, where at last it becomes the Congo.

10. The Middle Congo is a magnificent waterway of nearly 2000 miles in length between Nyangwe and Leopoldville.

1. Near Nyangwe it drops on to a great forest-clad plain, and at once broadens out to about a mile in width; just on the Equator navigation is completely stopped by the Stanley Falls, where the river again drops to a lower level; and from the Stanley Falls it makes a magnificent sweep westward to Stanley Pool, crossing the Equator again just above its confluence with its great northern tributary, the Mobangi.

11. Below Stanley Pool, in order to force its way to the sea, the Lower Congo has to compress itself into the winding channel of the Livingstone Rapids.

1. Ocean vessels can navigate the 100 miles up to Vivi (Matadi), though most stop at Boma, and the 88 miles between Isangila and Manyanga are navigable; but the 50 miles from Vivi to Isangila is a series of boiling cataracts, and the same is true of the 85 miles from Manyanga to Leopoldville.

N.B.—The force of the current may be estimated from the fact that the mud is carried out into the Atlantic for 300 miles.

12. The most important part of the whole river is the 1200 miles of unbroken navigation between Stanley Falls and Stanley Pool.

1. Between these two points the river broadens out from 15 to 20 miles in width, and is joined by at least twenty magnificent tributaries, including the Aruwimi from the dense forests below Mount Ruwenzori. Consequently, about 7000 miles of waterway converge on Stanley Pool, giving access in various directions to an area a dozen times the size of Great Britain; and the whole of this enormous area is rich in palm oil, rubber, and ivory.

13. The Congo basin is practically confined to the Congo State, which is therefore a natural whole, but it has great facilities for trade beyond its own limits.

1. In the south, the Kassai, which is navigable for 1000 miles, gives easy access to the Zambesi. Indeed, Lake Dilolo sends streams into *both* rivers.
2. In the north, the Mobangi-Welle, which is navigable for 600 miles, gives easy access to the Nile and the Southern Sudan.
3. In the east, the Lukuga valley gives easy access to Lake Tanganyika, one of the great trade areas of the future.

14. The Nile is the longest river in the Old World. Its history is fascinating, and it has immense political and commercial importance; but, simply as a river, it cannot compare with the Congo.

1. Egypt has been called 'the gift of the river,' and the name is significant of the part played by the Nile in the history of the country. Politically, the Nile is the bond between Egypt and the Sudan, and its great eastward bend puts Berber into direct political relation to Suákin. Commercially, it is the one highway northwards from the Equator to the Mediterranean; its current is always strong enough to carry a boat down stream, and from April to October the Etesian gales blow steadily up stream.

15. Like the Congo, the Nile has its source among the lakes of the eastern plateau, and has two great source streams.

1. The Victoria Nyanza is just under, and Lake Bangweolo is just over, 4000 feet above the sea.
2. The White or 'Clear' Nile, like the Lualaba, flows northward from its very source, and unites all its headwaters in Lake Albert as the Lualaba does in Lake Lanji.

3. The Blue or 'Muddy' Nile like the Luapula, is the eastern branch, and flows at first southward from Lake Tsana, as the Luapula does from Lake Bangweolo.

16. Like the Congo, too, the Nile is terribly spoilt by hostile climate and physical obstacles.

1. The climatic difficulty, however, is desert, not fever-haunted forest ; and the obstacles are in the middle, not the lower, course. For instance, in the 1500 miles between Alexandria and Berber, where the Nile enters the desert, not a single permanent tributary joins the river ; and between Khartum and Assuan there are as many as six cataracts, which more or less hinder or actually stop navigation.
2. On the other hand, the Lower Nile provides 800 miles of unbroken navigation outside the Tropics toward the great markets of Europe ; and the fertilising mud brought down by the Blue Nile and the Atbara is deposited along the banks of the river instead of being carried out to sea.

17. The Niger rises in forest-clad hills quite close to the Sierra Leone coast, and flows directly inland for 1000 miles—to the latitude of Timbuktu and the longitude of London—before the edge of the Sahara plateau diverts it to the south-east.

1. These hills have one of the heaviest rainfalls in Africa, which accounts for the river's volume ; and the lowness of the watershed accounts for the comparative absence of cataracts except near Rabba, where the river breaks through the West Coast Range to the sea.

N.B.—The proximity of the desert, as in the case of the Nile, accounts for the deficiency of tributaries.

18. The commercial and political importance of the river is, therefore, immense.

1. The main stream commands the Western Sudan, and its Benué tributary commands the Central Sudan, as the Nile commands the Eastern Sudan. It also commands a huge area of tropical forest, which must be of untold value, quite apart from the value of the river itself as a highway of commerce. Consequently, the Niger, like the Nile, is the centre of some very difficult political problems ; and, like the Congo, it will be the centre of an enormous and most valuable trade.

19. The Zambesi has been called the 'Congo' of the East Coast, and it certainly is much the most important river along that coast, especially to Europeans.

1. Like the Congo, it flows right across the plateau; it is entirely within the Tropics; and the northern and southern limits of its basin are very vague—streams flowing indifferently and according to the season into the Zambesi or into the Congo and Lake Ngami.
2. Unlike the Congo, it flows eastward; it has a much larger proportion of its basin north of its course than south of it; and the level is uniformly very high—owing to the general slope of the African plateau from east to west.
3. This slope causes its chief central tributary, the Loangwa, and all the tributaries from the Matoppos Hills, to flow from the east, as the main stream itself does at first, under the name of the Liba.
4. The Zambesi gives easy access to the high-level lake region, which is the healthiest part of Tropical Africa, and therefore the part of most value to Europeans; and this region also connects the Zambesi with the Nile, *via* the Stevenson Road and the Great Lakes.
5. The obstacles to navigation are mainly, the silting up and shifting of all the delta channels except the Chindé, the dangerous rapids at the edge of the plateau above Tete, the 50 miles of the Murchison Rapids on the Shiré, and the wonderful Victoria Falls, where a mile's width of water drops suddenly 400 feet into a chink of 100 yards in width.

20. The Orange and the Limpopo are not much better than feeble caricatures of the Nile and of the Niger.

1. The Orange River rises in two main streams amongst the Draken-Berge heights, where the rainfall is abundant, and flows right across the continent for 1200 miles; but it suffers so much loss of volume in the desert that it would be practically useless for navigation, even if its course were not broken by the Great Anghrabies rapids and its mouth blocked by a bar.
2. The Limpopo rises on the famous Witwatersrand, and empties near enough to the fine harbour of Delagoa Bay for its 60 miles of navigable water to be very useful for commerce;

but its chief use is as an indisputable political boundary to the Transvaal. Like the Niger, it makes a great curve back on itself, and all its main tributaries drain the plateau within the curve.

Lakes.

1. The African lakes are of two main classes—those which have, and those which have not, any permanent outlet.

1. The former are fresh, and are generally connected with one of the four great oceanic rivers ; the latter are saline, and are generally connected with one of the three large areas of inland drainage.

2. The saline lakes may again be divided into two kinds.

1. The larger, *e.g.* Lake Chad and Lake Ngami, are in the heart of the continent along the tropic edge of the Sahara and Kalahari Deserts ; and, as they have outlets when they are very full, their salinity varies.

2. The smaller, *e.g.* Lake Rudolf and Shott Melrikr, are along the outside rim of the general plateau, most of them being along the Mediterranean and Red Sea coasts.

3. Both kinds vary immensely in size. For instance, in the rainy season Lake Chad rises from 20 to 30 feet, and expands into an inland sea as large as Switzerland or Greece ; and its chief tributary, the Shari, becomes a navigable waterway.

3. The fresh-water lakes are also subdivided into two classes.

1. All the most important, *e.g.* the Victoria Nyanza and Lake Tanganyika, lie along the continental axis of the high eastern plateau, where they form large reservoirs for the great rivers, especially the Nile.

2. The less important ones, *e.g.* Stanley Pool and Lake Delu, are simply expansions of the great rivers, and are common in the Niger and Congo basins, where they are very useful in regulating the currents and controlling floods.

3. The former are evidently destined to play an important part in any trans-continental trade-route from north to south, and the equatorial group are generally called the Great Lakes.

4. The Great Lakes 'radiate' at various heights from the Victoria Nyanza, which stands actually on the Equator, at a height of nearly 4000 feet.

1. In the Nile system, Lake Albert Edward is 800 feet lower than the Victoria Nyanza, and the Albert Nyanza is 800 feet lower than Lake Albert Edward.
2. In the Congo and Zambesi systems, Lake Tanganyika is 1300 feet lower than the Victoria Nyanza, and Lake Nyasa is 1100 feet lower than Lake Tanganyika.
3. The highest lake in Africa, however, is Lake Tsana, from which the Blue Nile issues nearly 2000 feet higher than the White Nile issues from the Victoria Nyanza ; and Lake Bangweolo comes third.

5. By far the most important of these Great Lakes are Victoria Nyanza, Tanganyika, and Nyasa.

1. The Victoria Nyanza, the largest fresh-water lake in the world except Lake Superior, is nearly as large as Scotland ; its circular basin is about 200 miles across, and has gently sloping sides ; its chief feeder is the Kagera, and its chief outlet is the Somerset Nile.
2. Lake Tanganyika has not quite half the area of the Victoria Nyanza, but it is the longest fresh-water lake in the world ; it runs in a deep, steep-walled trench for nearly 400 miles ; its chief feeder is the Malagarazi, and any surplus waters escape into the Congo *via* the Lukuga.
3. Lake Nyasa, which is similar to Lake Tanganyika both in shape and shores, though smaller, is still twice the size of Lake Ladoga (= Wales) ; it is joined to Lake Tanganyika by the famous Stevenson Road, and discharges its surplus into the Zambesi, *via* the Shiré.

CLIMATE AND PRODUCTIONS.

Climate.

1. The size of the continent is so enormous that there must be great differences of climate ; but so much of the surface is within the Tropics that the actual heat of the sun does not vary greatly, and the main differences are due to height and moisture.

1. Owing to the shape of the country, much more land falls within the Tropics in the north than in the south ; and the continental northern area is, therefore, both hotter and drier than the peninsular southern area.
2. The proximity of Europe and Asia further increases the drought and the heat in the north, while the greater height of the south diminishes both.

N.B.—Tunis is in the latitude of Tokio, and Algeria in that of North Carolina ; Cape Town is in about the same latitude as Buenos Aires, and Natal is in the same as New South Wales.

2. The effect of the height and slope on the climate may be illustrated in various ways :—

1. Very few areas of the continent north of the Equator have an average temperature of less than 70° , while very few areas south of the Equator have an average of more than 80° .
2. Ruwenzori and Kenia, though practically on the Equator, are covered with perpetual snow for 2000 or 3000 feet downwards from their summits ; and all the Abyssinian peaks which are above 13,000 feet, are snow-capped.
3. There are belts of vegetation up the sides of all these mountains, changing with the height—from indigo-beds and coffee-plantations to fields of wheat and barley, and then on to forests, strips of bamboo, and, lastly, 'Alpine' grasses.
4. The best Algerian grapes are grown on slopes that look southward, while the best Cape grapes are grown on slopes that look northward ; and, generally, the extreme north and the extreme south of the continent owe their temperate climate partly to the fact that they slope away from the sun.

3. The effect of the ocean may also be illustrated in various ways :—

1. The average rainfall on the seaward slopes of the Niger watershed is over 100 inches a year, while at Timbuktu it is under 10 inches.
2. The difference between the hottest and the coldest months and between night and day is enormously greater in the Sahara, *e.g.* in Tuat or Kufra, than along the coast, *e.g.* at Sierra Leone or Mombasa ; and the extremes generally are much greater throughout the continental north than in the peninsula.
3. Bagamoyo, *to* which the Trade Winds blow off the Indian Ocean, has four times as much rain as Loanda, *from* which the Trade Winds blow on to the Atlantic.
4. The forests of the Congo basin, themselves caused by the heavy rainfall, attract clouds and increase the rainfall ; the sandy Sahara, itself caused by the want of rain, tends to evaporate rather than to precipitate moisture.
5. The west coast of the peninsula gets much less rain than the east coast, partly because the cold Benguela current evaporates very slowly, and partly because of the winds. Thus, Inhambane gets seven or eight times as much rain off the warm Mozambique current as Walvisch Bay gets off the cold Benguela current, though at neither place are there regular winds blowing landwards ; and, owing to the same cause, the average temperature of Walvisch Bay is 10° colder than that of Inhambane, and the average temperature of Benguela is about 20° colder than that of Mozambique. Cf. (3) above.

N.B.—Where cold and warm currents meet, as off Cape Agulhas ('The Needles,'), there are constant fogs. Cf. the Newfoundland Banks and the Malström.

4. The particular amount of moisture carried inland depends mainly on the character of the winds.

1. The Trade Winds, of course, blow only to the east coast and practically within the Tropics ; the N.E. Trades deposit about 100 inches of rain every year at Mombasa, and the S.E. Trades deposit a similar amount at Tamatave—both blowing off a very warm ocean.
2. The Anti-Trades, on the other hand, can blow only to the west coast and outside the Tropics, and therefore they can reach only the north-west and south-west corners of the

country ; the south-westerns deposit 50 inches of rain in parts of Morocco, and the north-westerns do the same behind Cape Town, but both are prevented by mountains, *e.g.* the Atlas and Table Mountain, from penetrating inland.

3. The great heat of the Sahara in summer causes a S.W. monsoon to blow inland off the Gulf of Guinea ; but the latter is not nearly so warm, and therefore does not evaporate nearly so much water, as the Indian Ocean. There is also a S.E. monsoon in summer off the Red Sea.
4. As each Tropic in turn is for half the year the centre of a belt of calms, no regular supplies of moisture can be carried to it during that half ; and, therefore, the one Tropic is marked by the Sahara, and the other by the Kalahari Desert. Cf. the Australian and Chile Deserts.
5. The narrow triangular peninsula naturally gets a much larger proportion of rain than the broad continental oblong and therefore has much more forest and much less desert. For the same reason it is also much more unhealthy except up on the plateaus.

Productions.

1. The Vegetation, of course, depends on soil and climate ; and it may be roughly classified as temperate and tropical.

1. In both cases there are strong contrasts owing to differences of rainfall.

2. The Temperate regions of the extreme north and the extreme south have a very similar climate—with winter rains, and produce very similar plants.

1. For instance, the vine flourishes as well in Algeria as in Cape Colony ; the pastures of Morocco produce as good wool and mohair as the Karroos ; the forests on the seaward face of the Atlas correspond to those on the seaward face of the Storm-Berge ; and the semi-desert alfa (*esparto*) of Algeria and Tunis has its counterpart in the heaths of the Orange basin.

3. The Tropical vegetation varies immensely—with the rainfall.

1. The desert and semi-desert regions have a very limited flora of their own—various species of mimosa and acacia being most common, and the date palm being the most valuable.
2. In the low West-Equatorial region, where heat and rain are evenly distributed throughout the year, there is typical 'Tropical' vegetation or 'wet jungle'—dense forest, with the oil palm and various creepers which yield india-rubber.
3. In the high East-Equatorial region, the typical formation is the savannah—wide stretches of grass, with or without trees; and the typical tree is the euphorbia or the baobab.
4. The whole continent may, therefore, be roughly divided into seven natural regions.

1. The Mediterranean region produces the olive, the fig and the vine, and—in the drier areas—large quantities of alfa, which is exported mainly to the French paper mills. The rainfall, as in South Europe, is practically confined to the winter and spring.
2. The Sahara region produces the date palm, and supplies sufficient pasture for the various nomadic tribes—Hamitic and Semitic—whose nomadic habits are the result of their wanderings in search of pasture. Except in a few specially favoured places, the pastoral wealth is limited to camels, because, as the region is almost rainless, the vegetation is generally limited to plants with leaves so small, or so leathery, or so thorny, that there is little evaporation from their surface, *e.g.* gum-acacias and tamarisks. Cf. p. 264.

N.B.—There are also plants which store water in bulbous roots. Cf. the Kalahari Desert.

3. The soil and climate of the continental Sudan admit of both pasture and agriculture—the ruling Hamitic race being devoted to cattle-rearing, while the subject Negroes cultivate durra and other plants.
4. The Nile valley forms naturally a separate region, dependent for moisture on the annual inundation of the river; and its resources are almost entirely agricultural, especially cotton, wheat, and pulse. Its most typical native plant is the papyrus, which grows round lakes and along sluggish streams.

N.B.—The average rise of the Nile is 24 feet; less than 22 feet is not sufficient, and more than 26 feet does great damage.

5. Western Equatorial Africa, with its intense humidity and even heat, is the home of the pure Negro and the anthropoid apes. The high even temperature and the constant

rain make it a region of dense forest, with dark tangled undergrowth; among its most valuable plants are the oil palm, the banana, the ebony, the coffee-shrub, and various rubber-producing creepers.

6. The Great Eastern Plateau consists largely of savannahs, the home of 'big game,' and equally suitable for pasture or agriculture. The facilities for pasture tempted the Hamitic nomads to expand southwards over the plateau; the western savannahs produce, under Negro cultivation, large crops of millet, cassava, or other food-plants; and Europeans have introduced coffee. The year is divided into dry and wet seasons.
7. The extreme south reproduces more or less the conditions of the extreme north, with the same contrast of semi-desert pasture inland and agriculture along the coast. Sheep, goats, and the vine flourish in both areas; but in the south the ostrich replaces the camel, and maize and tobacco replace the olive and the fig. The area of desert in the south is also comparatively insignificant.

5. The vegetation thus reflects some of the physical characteristics which have made Africa historically 'The Dark Continent.'

1. The most fertile parts are the most unhealthy, and the difficulty of getting food in the healthier parts sometimes led to cannibalism.
2. The physical uniformity of large areas did not favour the growth of clearly-defined states with political and commercial organization. Cf. the Guachos of the Pampa.
3. A savage population, with no instinct for political combination, naturally made no demand for foreign goods; and there were no vegetable products to support any extensive export trade, commerce being practically confined to slaves, ivory, and gold.

6. The characteristic fauna of Africa may be roughly classified under three heads.

1. The desert regions produce the camel and the ostrich, and in Egypt there are also many varieties of aquatic birds, *e.g.* the stork, pelican, and flamingo.
2. The West-Equatorial forest region is unfavourable to general animal life, but is the home of the gorilla and the chimpanzee, the elephant and the hippopotamus.

3. The Great Eastern Plateau has an abundance of large animals, including the lion and the elephant, the giraffe and the zebra, the crocodile and the rhinoceros ; and 'big game' are generally attended by the dreaded tsetse fly.

N.B.—The animal products include, therefore, ivory, ostrich-feathers, and skins. North and South Africa also export wool, and Madagascar and West Africa export wax.

7. The mineral products include coal and iron, gold, copper, diamonds, and salt.

1. Coal has been found in the Zambesi basin, but is worked almost only in Natal, Cape Colony, and the Transvaal area.
2. Iron is known to exist in considerable quantities over most of Tropical Africa, and there are rich deposits of it in the Atlas Region. It is worked mainly in Algeria, and is exported from Benisaff.
3. Gold is exported from South and South-East Africa, and from the Gold Coast ; and the deposits in the south-east are very rich, especially in the Transvaal.
4. Copper is worked mainly in Cape Colony, Darfur, and the Atlas Region.
5. The diamonds are most abundant in the Kimberley district of Cape Colony, and the salt 'shots' are most productive in the Western Sahara.

THE BARBARY STATES.

1. NORTH AFRICA may be divided into two parts—a mountainous western part and a low eastern part.

1. The height and the nearness to the Atlantic give the western part a much better rainfall than the eastern ; but in both parts the Mediterranean slope has much more rain than the Sahara slope.
2. The Marocco Range, or Great Atlas, is a real mountain range, with a lower parallel chain in the Anti-Atlas ; it is much the highest land in North Africa, and forms a distinct water-parting, *e.g.* between the Draa and the Sebu.
3. In Algeria and Tunis the formation is really a broad plateau with buttress ranges. The plateau is covered with salt-

swamps, or shotts, between which there are large areas of alfa (esparto); the seaward buttress contains a number of fertile valleys, known collectively as the Tell, in which the ordinary south European fruits and cereals are grown.

4. Tripoli is a still lower plateau, descending to the Jefara Plain and rising to the Barka Peninsula.

2. The products of the region correspond to its physical features.

1. The sheep and goats of the Great Atlas support the characteristic leather and carpet industries of Morocco.
2. The Tell valleys produce excellent wheat and barley, olives and grapes, oranges and lemons, while the plateau produces salt and esparto. The latter, however, is becoming less and less important, owing to the increasing use of wood-pulp in the paper trade.
3. The oases of Tafilet and Fezzan produce famous dates.

N.B.—Many artificial oases have been made by boring Artesian wells.

3. The Morocco towns may be classified as centres of commerce and centres of government.

1. The commercial centres are generally ports. Thus, Tangier is the medium of communication with the outside world for the North of Morocco, as Dar el Beida and Mazagan are for the centre, and as Mogador is for the south. Tangier, as the nearest to Europe, is much the most important.

N.B.—Spain owns the fortified port of Ceuta.

2. The political centres generally command inland communication from sites of military strength or agricultural wealth. Thus, Fez and Mequinez command the upper basin of the chief river of the country, the Sebu, while Morocco (= Marakesh, 'The Adorned') commands the fertile plain of the Tensift.
3. Fez, the largest city in the country, occupies a fine strategic position up amongst the spurs of the Atlas, from which it collects the material for its leather and 'Fez' cap industries. The *carmine* colour of the caps is due to the presence on the Atlas slopes of the species of oak which supports the *kermes* insect.

4. The Algerian towns are all found in the narrow strip between the outer terrace of the Atlas and the

sea ; but most of the people are scattered over the fertile Tell in agricultural villages.

1. Oran and Mostaganem are commercial centres in the west, as Bona and Philippeville are in the east ; and owing to the nearness of the outer terrace to the sea, the railway system connecting them with Algiers runs entirely inland parallel to the terraces, *e.g.* along the valley of the Shelif.

N.B.—Bona is the old Hippo, and Oran is the old Portus Divinus (so-called from its sheltered harbour).

2. Constantine, on the top of an almost impregnable rock, is the largest inland town ; and there are important centres at Biskra and Tlemcen, and in the oases of Wargla and Tuggurt, which command the traffic converging on Tuat for Timbuktu. Constantine has a soap industry in connection with the residue from the olive-oil mills.
3. Algiers, or 'The Islands,' is an extremely important place. It divides the distance between Port Said and London better than either Malta or Gibraltar ; it has a safer anchorage than Gibraltar, and gives greater facilities to shipping. For instance, it has a small basin specially reserved for men-of-war ; its large area makes it very useful as a fishing-port and a refuge ; and it has the advantage to merchantmen of two docks for repairs, abundance of fresh fruit and other provisions, and ample room for such bulky items as timber, coal, and wine casks.

5. Tunis has no town of great importance except its capital.

1. Bizerta and Goletta are commercial centres on the north coast, as Susa and Sfax are on the east coast, exporting mainly cork and esparto. Susa commands the route inland to the sacred city of Kairwan.
2. Tunis, like the ancient Carthage, owes its importance, not to the wretched harbour of Goletta, but to its position in the most central and narrowest part of the Mediterranean, with easy communication inland up the Mejerda valley. It has also now a ship-canal to the sea.

6. Tripolitana owes its importance to the number of caravan routes which converge on it.

1. The reason for this is that, owing to the deep indentation of the Sidra-Gabes Gulf, the starting-points of the caravans—Tripoli, Khoms, and Benghazi—are 250 miles nearer to the

Sudan than Oran, Algiers, Philippeville, or Tunis; and even the railways from Oran and Philippeville to Ain-Sefra and Biskra cannot compete with the Tripolitan routes, which might themselves be immensely improved by railways from Tripoli to Ghadames and Murzuk.

2. Ghadames is the most important inland centre in the country, and has trade routes diverging from it in all directions—to Wargla, Ain-Sala, Ideles, Ghat, Murzuk, etc.; and Murzuk comes next in importance, with the same staples of trade—ostrich feathers, skins, and ivory. None of these, however, are as important as the barley of the coastal districts.
3. As both the Ghadames and the Murzuk routes converge on Tripoli, it naturally does most of the foreign trade (in barley, feathers, skins, ivory, and esparto), and is the natural site for a political capital; but its harbour is shallow and dangerous. Its local industries are concerned with the preparation of feathers for the Paris, ivory for the London, and goat-skins for the New York markets.
4. The only other harbour of any importance along the surf-beaten coast is Benghazi, which commands the trade-route to Lake Chad, *via* the oases of Aujila and Kufra.
5. The other large towns, *e.g.* Zavia, Misrata, Zeliten, and Gharian, are concerned, like Tripoli, with the preparation of ivory, skins, and feathers. The skins come entirely from Kano, *via* Agades and Ghat, and the best ivory and feathers come by the same route; but an inferior ivory, full of crevices and very brittle, comes from the open 'park' lands of Wadai. Cf. p. 284.

7. Under the French flag Algeria and Tunis have made more progress than Marocco and Tripoli.

1. Apart from its political importance, Algeria is most useful to France as a great wine-producing country only one day's sail from Marseilles; and the cork-oak forests of the Atlas supply abundance of excellent cork for bottling purposes.
2. Marocco is still under an independent Sultan only because none of the European Powers will allow it to be annexed by any other Power, but French influence is gradually spreading over it. Tripoli is still a Turkish province.

THE CALMS OF CANCER.

1. The Sahara forms the western terminus of the great belt of deserts which stretches across the Old World from Mongolia to the Atlantic.

1. It is much the largest of the series, being nearly as large as Europe. The Arabian desert comes next in size, and the Mongolian third.
2. It is not a dead level; it is not a sea of sand; and it is not entirely without vegetation.
3. Most of it is a low plateau; and one of its characteristics is the presence of small, isolated, rocky plateaus, with perpendicular cliffs.
4. It also contains some mountain ranges; and those which shut in Lake Chad to east and west—the Tibesti and the Air—are between 6000 and 7000 feet high, and precipitate considerable quantities of rain in summer.
5. The Libyan Desert, however, is more or less a level stretch of sand, and there is a similar area in the Gidi Desert.

2. The cause of the desert is simply the absence or the deficiency of rain.

1. The North Tropic is the centre of a belt of calms in January, as the South Tropic is in July. Cf. p. 256.
2. In summer the intense heat over the sandy Sahara draws winds inland, but the heat itself tends to evaporate rather than to precipitate moisture.
3. On the seaward edge of the desert, where the winds are naturally wettest, there is either no condensing medium, *e.g.* in the Libyan and Gidi Deserts, or the medium is an absolute barrier to the passage of the winds inland, *e.g.* the Atlas.

3. The amount of sand is due partly to the variation of temperature and partly to the absence of vegetation; and it is distributed partly by wind and partly by water.

1. The enormous variation in temperature between day and night splits up the solid rock in all directions—to be distributed by wind.

2. Besides the storms on the mountains, there are also summer storms on the southern edges of the desert, where the dry Saharan air meets the moist equatorial air; and, as there is no vegetation to bind together the surface, the consequent torrents carry down immense quantities of loose soil.
3. The porous nature of these shifting sands, especially in the Hammada, enables any rain to sink into the ground before it can be evaporated, and this encourages the boring of Artesian wells (cf. p. 260); while the impervious nature of the 'Shott' beds allows any surface water to be evaporated before it can sink, thus covering the ground for miles with a crust of salt, especially in the Western Sahara.
4. The vegetation is of two kinds—a real desert kind and an oasis kind.
 1. The oases supply the date-palm, the most important product of the Sahara; and cereals and fibres (cotton and tobacco) are also grown in them.
 2. The true desert vegetation consists of plants which, by lengthening their roots or shortening their height or thickening their bark or limiting the size of their leaves, have adapted themselves to draw water from great depths or to resist the evaporating power of the intensely dry air. Cf. p. 257.
5. The population varies, both in number and in nationality, with the supply of water.
 1. The centres of population are naturally where the water supply is most permanent, *i.e.* in the oases, *e.g.* Bilma, Kavar, and Adrar, and on the mountain-slopes, *e.g.* Tibesti, Borku, and Air (=Asben).
 2. As the spring-water of the oases is much more reliable than the summer rains on the mountains, agriculture is practically confined to the oases; and, therefore, they have a fixed Negro population. Cf. p. 257.
 3. The typical desert people are not fixed and agricultural, but nomad and pastoral; and, therefore, the population of the Sahara generally is a wandering Hamitic one.

N.B.—The dry air of the desert makes the Hamitic nomads much healthier and hardier than the fixed Negro population of the moist oases
6. The trade of the Sahara is partly a transit trade and partly local, and it is all done by the camel.

1. There is a natural exchange of products between the temperate, coastal Barbary States, and the tropical, continental Sudan. From the north come the grain, cheese, and wool of Algeria and Marocco, and various European goods, *e.g.* cottons, tea, sugar. From the south come gold, slaves, ostrich feathers, ivory, gums, and wax.
2. The local trade is in the two desert staples, dates and salt. The dates come mainly from the northern oases, *e.g.* Tafilet and Murzuk, and are exported northwards; the salt comes mainly from the really 'desert' parts of the south-west, and is exported southwards, especially from Tandeni to Timbuktu.
3. There are five great trade-routes. The most important and the most central is from Tripoli, *via* Ghat and Air, to Kano. The others are from Mogador, *via* Tenduf, to Timbuktu; from the Atlas region, *via* Tuat, to Timbuktu; from the Fezzan, *via* Kavar and Bilma, to Kuka and Lake Chad; and from Benghazi, *via* Aujila and Kufra, to Wadai.

THE SUDAN.

1. THE Sudan stretches across the continent from the Atlantic to the Nile Valley, between the Sahara and the peninsular plateau.

1. The proper name for the region is *Bilad-es-Sudan*, *i.e.* 'the Land of the Blacks.'
2. It may be roughly divided into two very distinct areas—a continental plateau and a coastal plain.
 1. The continental area consists mainly of open savannahs at least 1000 feet above the sea, but includes also the low basins of the Senegal and the Gambia.
 2. The coastal area consists mainly of a narrow strip of low-lying forest-clad land along the Gulf of Guinea, but includes also the forested escarpment of the plateau.

N.B.—The name *Sudan* is often restricted to the continental area, the coastal area being called Upper Guinea. The 'Eastern Sudan' falls under the Nile Region. Cf. p. 270.

3. The continental area consists of three drainage systems—the basins of the Senegal and the Gambia, of the Niger, and of Lake Chad.

1. These three areas represent the typical African features of a coastal watershed, a great continental waterway, and an area of inland drainage.
2. All three are composed mainly of old crystalline rock, but the fertility and the rainfall vary with the distance from the Sahara. The northern border is a series of sand-dunes; the southern is a strip of forest; and, between the two, durra, cotton, beans, rice, and indigo are widely cultivated—the product varying with the rainfall.

4. The coast-lands are divided by Cape Palmas into two distinct regions.

1. The eastward region is naturally sheltered from the western gales which cause such devastation between Cape Palmas and the Senegal.
2. The Guinea current has carried so much sand shoreward, and the Atlantic tides have so completely checked the course of coastal rivers seaward, that a false shore has been built up, backed by lagoons, along most of the eastern coast.
3. Between these lagoons and the old shore there is a belt of dismal swamp, to which the Ivory and the Slave Coasts mainly owed the particular products that gave them their names; but the wealth of the country now lies in the oil-palms and rubber-creepers which grow to perfection in the deadly moist, hot, even climate.

5. The distribution of people and their occupations are characteristic of Africa.

1. The Black Man is the product of the intense heat and moisture of the Guinea Coast, which—by greatly increasing the supply of blood—increases the supply of colouring matter in the body; and he is naturally stationary and agricultural, growing bananas and maize on the forest-clad lowlands. There the dense masses of dark, damp forest have overwhelmed him, physically and morally, and left him—except in the open Yoruba country—passive and superstitious.
2. The Hamitic races are essentially nomadic and pastoral, but are not found pure in the Sudan. In their place there is a mixed race with mixed habits, of whom the Fulbe and the

Hausas are the best types. They are hardy and sanguine, agricultural and pastoral, nomadic and stationary, traders and settlers.

3. The Fulbe were cattle-rearers in the Futa-Jallon highlands before, like the Arabs elsewhere, they conquered the Negro tillers of the soil; and the Hausas were local carriers along the Benuë before they became the great traders of the Sudan, and made their language the great commercial medium throughout the Sudan and even over part of the Sahara Cf. p. 264.

6. The Trade routes in the Sudan, unlike those in the Sahara, run east and west.

1. The reason for this is that commerce was impeded by the sand-dunes along the north and by the dense forest along the south, but was encouraged by the savannah plateau in the centre and by the general east-and-west direction of the rivers. Consequently, nearly all the old commercial centres lie along the Sahara border, *e.g.* Kuka, Kano, and Sokoto, or along the southern forest-belt, *e.g.* Kong, Sulaga, and Ilorin.

7. The productions vary with the moisture, the heat being everywhere excessive.

1. The heavy damp heat of the coast-lands and the Lower Niger produces the oil-palm, rubber-creepers, and ebony.
2. The broad central strip of the interior produces durra, millet sorghum, cotton, and indigo, and contains splendid cattle pasture along the Niger and good horse pasture in Bornu.
3. The arid northern strip produces ostrich-feathers and goat-skins, while the forested southern strip produces ivory.

8. The Political Divisions of the Sudan illustrate three very important terms in political geography—'Sphere of Influence,' 'Hinterland,' and 'Line of Least Resistance.'

1. The mass of Africa is held or 'influenced' by various European nations, mainly the French and the British; and the Sphere of Influence is the area within which the missionary or mercantile interests of any particular nation are predominant, *e.g.* French interests in the Sudan and North Africa, and British in Egypt and South Africa.

2. The term 'Hinterland' applies to such part of the interior as may fairly be said to go naturally with any particular strip of coast ; but its meaning has been terribly strained by the French, *e.g.* along and behind the Guinea Coast.
3. Occupation of such a strip of coast is essential to any claim on the Hinterland, but European colonisation of the African coast—at least, within the Tropics—is practically impossible ; and, therefore, European domination needs a good harbour and easy access inland. Such access follows the Line of Least Resistance, which is generally a river valley (*cf.* the Senegal, Niger, Benué) ; and the influence of the particular nation is focused at the harbour (*cf.* Massawa, Mombasa, Lourenço Marques).

9. The mass of the Sudan is divided between France and Britain.

1. Germany owns the little colony of Togoland, which trades, *via* Bismarckburg, with the great continental markets of Sulaga and Yendi, and the unexplored Kamerun country.
2. Portuguese Guinea has easy access up the Rio Grande valley to the Futa-Jallon highlands ; its capital and chief harbour, Bissao, is on an island (*cf.* Konakri, Grand Bassam, and Lagos).
3. The independent State of Liberia has given its name to a lowland species of coffee which is exported from Monrovia.

10. The British domains include the Gambia, Sierra Leone, Gold Coast, Lagos or Southern Nigeria, and Northern Nigeria.

1. The Gambia Colony has an estuary which admits the largest vessels, and the river is navigable for 250 miles ; but Bathurst is the only town, and ground nuts are the only important product.
2. Sierra Leone, like the Gambia, is entirely cut off from the interior by French territory ; but the shelter of the Free-town peninsula makes the Rokelle estuary the best harbour along the whole coast, the position half-way between England and the Cape gives it political importance, and the deadly damp heat and the volcanic soil produce in luxuriance such products as oil-palms, kola, rubber, gum-copal, and pepper.

N.B.—The 'Grain' Coast takes its name from the kind of pepper known as 'Grains of Paradise.'

3. The Gold Coast is not nearly so famous for gold as it was in the days when it gave a name to the English *guinea* coin, though it produces actually more gold-dust. Its most valuable products now are palm-oil, rubber, and ebony. Accra is its capital and its largest town, and Cape Coast Castle commands the only good road inland (to Kumasi and Bontuku); but the new Ptal valley railway to Kumasi will make Sekondi the most important place.
4. Lagos itself is an island town on the sandbank which separates the coastal lagoons from the sea; but, as it is the outlet for the palm-oil and palm-kernels of the Yoruba district, and has a safe harbour and easy communication inland, it has become the most important town on the Gulf of Guinea.

N.B.—The size of the Yoruba towns, *e.g.* Abeokuta, Ibadan, and Oyo, is a relic of the slave-trading days, when all the inhabitants of the country took refuge behind their walls.

5. The old Lagos Colony is now called the South Nigeria Colony, and includes the old South Nigeria Protectorate, the political capital of which was Asaba. All the chief centres are now on the delta, *e.g.* Calabar, the capital, Bonny, Brass, Akassa, etc. The Niger is, of course, the natural outlet for the Central Sudan; but the local products of this lower basin are mainly oil, rubber, and ebony.
6. The Northern Nigeria Protectorate, which is administered from Zungeru, includes the old 'continental' domains of the Royal Niger Company, *e.g.* the Sokoto Empire. There are four typical kinds of towns—old native capitals, *e.g.* Bida, Yakoba, Zaria,—great caravan termini, *e.g.* Kuka, Katsena, and Sokoto,—river ports, *e.g.* Rabba, with a portage round the Niger rapids, and Yola, commanding the ivory trade of the Adamawa forests,—great land or water junctions, such as Lokoja and Kano.

Kano is the commercial capital of the Central Sudan, being the terminus of the chief Saharan route, and manufactures blue cottons from the product of the surrounding cotton and indigo lands.

11. The French domains include Senegambia, French Guinea, and the French Sudan.

1. Senegambia includes all the lower basins of the Senegal and the Gambia, except the British strip along the Gambia; but its commercial value is not very great, the products being more or less limited to ground-nuts and some rubber and gum. The capital, St. Louis, stands on an island in the Senegal estuary; but it is so much impeded by a

shifting bar that a railway has been built from it to Dakar Bay under the shelter of Cape Verde.

2. The French 'Sudan' has its capital at Kayes, on which most of the foreign traffic at present converges ; and amongst its other important centres are Bafulabe and Bamako, where traffic respectively leaves the Senegal and strikes the Niger ; and Kong, which commands the Kornoe Valley. Timbuktu, which is connected with its port of Kabara only at high water, is much less important than it used to be ; but some of the eastern towns are growing very important, *e.g.* Abeshr and Masenga.
3. French Guinea now includes the old colony of the same name, the Ivory Coast, and the French Slave Coast. It produces rubber, palm-oil, sesame, and gum ; and its chief towns are Konakri, Bingerville, Porto Novo, Grand Bassam, and Whyda (the port of Abome).

THE NILE REGION.

1. THE Nile valley may be divided into five natural zones—of delta, desert, steppe, savannah, and lake.

1. The Lake zone belongs entirely to the Great Eastern Plateau (*cf.* p. 244), but its importance to Egypt is very great, because it is to the lake reservoirs that the Nile owes the constant and reliable part of its volume. The White or 'Clear' Nile also owes its clearness to the filtering of its mud in the lakes.
2. The Savannah zone lies between Lado and Fashoda ; and its general surface is so level that the current becomes very slow, and the river is often choked with enormous masses of floating vegetation. Similar masses are brought down from the Nile-Congo waterparting by the Bahr-el-Ghazal and its numerous tributaries ; and it is partly the impact of the latter, though mainly the abrupt rise of the Bagara plateau, that makes the Nile curve so sharply eastward.
3. The Steppe zone lies between Fashoda and Berber, and shows a gradual transition from a fertile rainy district to a barren dry one. The zone is, however, very important, because it is to the torrential rains round the sources of the Blue or 'Muddy' Nile that Egypt owes its fertilising inundations.

4. From its confluence with the Atbara, its last permanent tributary, the Nile enters on its desert course, during which it loses so much water by evaporation that its volume actually diminishes as it approaches the sea (cf. *The Orange*, p. 251). The five cataracts between Berber and Assuan are a succession of rapids caused by rocks which impede or prohibit navigation except at very high water.
5. The Delta proper begins just below Cairo with the Barrage weir, which controls the irrigation of all the deltaic lands ; but the Fayum has so much in common with the Delta that they may be classed together.

2. The Savannah zone has ordinary 'Tropical' climate and vegetation, and its importance is mainly commercial.

1. The year is divided into two long rainy seasons, with a short dry season between them ; and, therefore, the products include rubber, gums, cotton, and ivory (from the forest area). All the export trade converges on Fashoda.
2. The Nile was so much choked with floating vegetation above Sobat that continuous navigation was quite impossible ; but the splendid river-side pasture has made even the Negro tribe of Denkas forsake their customary agriculture for cattle-rearing, and cutting the sudd has much improved navigation.
3. The Nile-Congo waterparting is so rich in iron ore that the Bongo Negroes have also forsaken their ordinary occupation of tillage for that of skilled mechanics ; and the prevailing ruddy colour of the iron-impregnated soil is even reflected in the reddish tinge of their skins.

3. The Steppe zone is characterised by thorny scrub and rugged heights, and its importance is mainly political.

1. The position of Berber or Kassala would enable any hostile Power on the Upper Nile to divert all the transit trade of Egypt to Suákin and Massawa.
2. The possession of Khartum (Omdurman) would enable such a Power to command three great waterways—north, south, and south-east—and to control the whole supply of water and mud which alone makes agriculture possible in Egypt.
3. In the same way the Kordofan capital of El-Obeid commands the caravan trade, *via* El-Fashr, with the rich wheat and tobacco lands of Darfur, the copper mines of Hofrat, and the general trade of the Eastern Sudan.

4. The most important feature of the Desert zone is the long narrow trough hollowed out by the river, which is the key to the history of the whole country.

1. It has been the one great highway of commerce and communication through a land naturally isolated by barriers of desert or sea on every side ; and thus it helped to keep the inhabitants united, and facilitated the access of the White Man into the domain of the Black Man.
2. On the other hand, it divided Egypt naturally into two parts, Upper and Lower, Valley and Delta ; and the country is so long in comparison with its breadth that it was always very difficult to govern from a single centre (cf. Italy and Chile). Thus, three different sites have been tried for capitals : Thebes (near Keneh) commanded the valley, Alexandria guarded the approach from the sea, and Cairo keeps the balance of power where valley and delta meet.

N.B.—The old name of Egypt was Mizraim, 'the *two* lands of red mud,' and its old kings even wore *two* crowns.

3. The banks of the river are covered with the ruins of old cities and with oasis-like vegetation. The most important products are wheat, pulse, and sugar ; and the wonderful preservation of the antiquities, *e.g.* the Sphinx and the Pyramids of Gizeh or the temples and other buildings of Memphis, Thebes, and Ibsambul, is due to the intensely dry air. Cf. p. 117.

N.B.—Contrast the 'weathering' of Cleopatra's Needle since its removal to the banks of the Thames.

4. The important centres now are either where there are special facilities for irrigation, *e.g.* Siut, or where cataracts break regular navigation, *e.g.* Assuan and the great railway junction of Wady Halfa, or where a sudden bend in the course of the river offers a 'short cut' by rail or caravan, *e.g.* Keneh, Korosko, and Abu-Hammad.

5. The Desert zone has three other important features—the Northern Oases, the Red Sea Littoral, and the Suez Canal.

1. Important pilgrim or commercial routes follow the lines of the various oases which lie between Assuan and the Tripoli frontier. For instance, there is a great pilgrim route to Siut (for Mecca) *via* the Siwa and the Bahrieh oases ; and great commercial routes from Siut and the Farafrah oasis converge on the Dakhel and Khargheh oases for Darfur.

2. The Red Sea Littoral consists mainly of a high system of barren mountains, attaining in the Jebel Zebara a height of 7500 feet and in the Jebel Gharib one of nearly 8000 feet ; and it includes politically the interesting Asiatic peninsula of Sinai. But its only important centres are the ports of Kosseir and Suákin. The latter, which is the best harbour on the Red Sea, is an island in a natural basin of coral.
3. The 100 miles of the Canal save 3000 miles on the Cape route from Liverpool to Bombay, and three-quarters of the steamer tonnage using it is British ; but, as the 'canal' type of steamer is by no means suited to the stormy Cape route, any block in the canal would completely disorganise our Eastern traffic except *via* the Canadian Pacific Railway—fortunately, a safe and quick route, and entirely in British territory. Port Said and Ismailia, of course, owe their very existence to the canal ; but Suez has not benefited much by it. Cf. pp. 159, 160.

6. The Delta consists of the refuse of the Abyssinian Mountains, and the whole of it is irrigated by artificial canals or by back-waters of the Nile.

1. It is, therefore, by far the most fertile and most important part of Egypt, and contains more than half the total population—employed in raising cotton, maize, and rice ; and, as the climate is distinctly continental, it is quite healthy except during the subsidence of the floods.
2. The only branches of the Nile that still reach the sea are those from which the little towns of Rosetta and Damietta take their names. Damietta, the third largest town in the whole country, has nearly 40,000 inhabitants ; but Rosetta, which is overwhelmed by its nearness to Alexandria, has scarcely 20,000.
3. Alexandria (over 350,000), with its fine artificial harbour, is the chief port of Egypt, and commands all traffic from or to the west. It is joined by a ship-canal to the Rosetta mouth of the Nile, and by rail to every important town in Egypt.
4. Cairo (about 600,000), however, is the most important city in the country. It stands above the river on the most northerly spur of the eastern plateau, where all traffic must converge to enter or leave the Nile Valley ; and it commands the whole rail, river, and canal system, including the Fresh-Water Canal to Ismailia. It is, therefore, the natural site for a political capital.

2. British Somaliland is in somewhat a similar position, its three ports being Berbera, Zeila, and Bulhar.
3. Britain also possesses an important strategic position in the island of Sokotra, with some commercial importance, cattle and aloes being exported from the port of Tamarida.
6. Abyssinia is a volcanic plateau, nearly twice the size of Great Britain, averaging 8000 feet in height, and buttressed by very steep escarpments on the east and the west.

1. The east edge is steeper and higher than the west, rising to about 15,000 feet in the Simen and Gojam ranges ; and, as the prevailing wind in summer is a monsoon drawn off the Indian Ocean towards the fiery Sahara, the rainfall on these eastern peaks is very heavy.
2. The heavy rain, the friable volcanic soil, and the great height from which the rivers fall, cause them to plough very deep, cañon-like beds, the excavated soil being carried down the Nile to fertilise Egypt ; the sides of these gorges, where not too precipitous, are clothed with dense fever-haunted forests ; and, therefore, communication becomes almost impossible except in the Tsana basin.
3. The surface is thus cut up into a number of small island-like plateaus, which, owing to the volcanic soil and the heavy rainfall, are extremely fertile, and tempt even the non-negro population into agriculture, while the mountain slopes supply splendid pasture.
7. The political divisions of the country and its economic isolation are, therefore, the direct result of its surface features.

1. Thus, the Takazze separates Tigré from Amhara, and the Blue Nile separates Gojam from Shoa ; and each of these divisions is cut up into hundreds of smaller ones.
2. The economic isolation of the country is both maritime and fluvial ; it is almost inaccessible from the sea, and its rivers have rather hindered than helped communication with neighbouring countries.
3. There is one fairly good trade route, however, which both unites the greater part of the country internally and gives access to the sea ; it runs from Lake Tsana through Debra Tabor and Adua to Massawa.

8. Abyssinia may be divided into three climatic zones, with corresponding zones of vegetation.

1. The purely 'tropical' zone is all the land below 5000 feet, *i.e.* the outer slopes of the plateau and the river valleys. They are largely covered with dense elephant-haunted forests; but in the more open parts, coffee, cotton, sugar, bananas, and indigo are cultivated.
2. The 'warm-temperate' zone includes the ordinary plateau lands, and produces all the cereals and fruits of South Europe as well as excellent cattle pasture.
3. The 'cool-temperate' zone includes all the land above 8000 feet; and its most valuable product is probably the musk deer, which accounts for the presence of musk in the exports of the country.

9. Almost all the chief towns lie in the middle of agricultural areas or on trade-routes.

1. Gondar, the religious capital, and Korata are on the Tsana plain; Ankobar and the political capital of Addis Abeba are in the Blue Nile Basin; and Adua and Sokota are in the Takazze basin.
2. Adua and Ankobar command the foreign trade *via* the Red Sea and the Gulf of Aden, the most important exports being coffee, gold, and ivory.
3. The fortress of Magdala stands on an almost impregnable peak, more than 9000 feet high, above the ravine cut by the Bashilo river.

EAST AFRICA.

1. EAST AFRICA consists mainly of a broad, high Y-shaped plateau, running from the depression marked by Lake Rudolf southward to the Zambesi gorge.

1. Its average elevation is about 4000 feet (nearly = Ben Nevis), and its average breadth north of Lake Rukwa is between 700 and 800 miles.

2. Like the Abyssinian plateau, it is buttressed by high mountains which overhang deep valleys.

1. The outward edge of the eastern buttress rises in distinct steps from a strip of low coast-land, while that of the western buttress falls almost unbroken to the Congo forests.
2. The broad central plateau between Lake Rukwa and the Victoria Nyanza is formed of very old crystalline rock; but the mountain buttresses and the deep troughs below them are of much newer volcanic formation.
3. The highest peaks are in the eastern, *i.e.* the seaward, range, where Mount Kenia and Kilima Njaro rise to a height of 18,400 and 19,700 feet respectively; the longest and deepest lakes are in the western valley, *e.g.* Lake Tanganyika and Lake Nyasa.
4. The highest elevation of the central plateau, like its greatest breadth, lies between Mount Ruwenzori and Mfumbiro on the west and Mount Kenia and Kilima Njaro on the east; and it forms the water-parting between the Nile and the Zambesi.
5. As this water-parting is just on the Equator, it catches both the N.E. and the S.E. Trades; and, as even the western buttress is not 800 miles from the sea, and attains in Mount Ruwenzori a height of nearly 17,000 feet, the watershed has a very heavy rainfall, and is crowned with perpetual snow.
6. Where the two buttresses and the two lines of lakes meet, in the Livingstone Mountains and Lake Nyasa, the highest peaks do not exceed more than about 11,000 feet, and they are terribly cut off from the S.E. Trades; but they are not 400 miles from the sea, which is some compensation.

N.B.—The S.E. Trades are largely intercepted by the high mountains of Madagascar.

3. The lakes are the characteristic feature of East Africa, and they are of two distinct types—elongated and circular.

1. The former occur in the great valleys; and, like the typical Alpine lakes in Europe, they are long, narrow, and deep. For instance, Lake Nyasa is nearly 350, and Lake Tanganyika is nearly 400, miles long—the latter being the longest fresh-water lake in the world. The circular lakes occur on the plateau; and, like the typical Baltic lakes in Europe, they are broad and comparatively shallow.

2. There is a further distinction between the eastern and the western valleys. The lakes in the eastern valley have generally no outlet, and are therefore gradually becoming salt, *e.g.* Lake Rudolf, Baringo, and Eyassi; while all those in the western valley have an outlet to one of the three great rivers, *e.g.* Lake Tanganyika to the Congo, Lake Nyasa to the Zambesi, and Albert Nyanza to the Nile.

4. The different types of lakes have, therefore, a very different economic value.

1. The circular type has the greater effect on climate; for instance, the Victoria Nyanza—which is as large as Scotland—is quite large enough to have a distinct effect both in equalising temperature and in causing ‘land’ and ‘sea’ breezes.
2. As reservoirs for large rivers, the long, narrow type is better; their nearness to the mountains increases the rainfall and causes them to be snow-fed in summer, while their small expanse of surface and the much lower elevation decrease the evaporation.

N.B.—The Nile leaves the Victoria Nyanza at a height of 4000 feet, while the Shiré leaves Lake Nyasa at a height of only 1300 feet.

3. As highways of commerce, the long narrow lakes are much the more useful, owing mainly to the distance over which they extend, but partly also to their lower elevation. The greater depth is a further advantage, especially in the matter of harbours; for the circular lakes have generally swampy reed-choked shores, *e.g.* Lake Bangweolo, while the long lakes have steep rocky banks.

5. Compared with the lakes, the rivers are absolutely unimportant; but several that flow seaward from the eastern buttress have considerable length and volume.

1. For instance, both the Tana and the Sabaki draw a large volume of water from the snowy peaks of Kenia and Kilima Njaro; and the Tana, though made difficult and dangerous by the trunks of uprooted trees, is navigable for about 200 miles, while the Sabaki valley is the natural route for the railway from Mombasa to Lake Naivasha and the plateau generally.
2. The Rufiji and the Rovuma, rising in the Livingstone Mountains, have more variable volume; but each has a tributary—the Ulanga and the Lujenda—drawing its water from a

swampy reed-choked valley, which helps to regulate the volume. Both of the rivers are partially navigable; and the Rovuma, like the Juba in the far north, is also a convenient political boundary.

6. The climate varies, of course, with the height and the distance from the sea.

1. The coast-lands have the greatest heat and heavy rain, except towards the Somali desert; and they are therefore covered with rank tropical vegetation, including bananas, gum-copal, and rubber-creepers. The latter are most abundant in the Wang'a, Malindi, and Tana districts.
2. The lower steps of the plateau are dry and barren, except for strong scrub and euphorbias, especially between Kilima Njaro and Ugogo.
3. Those parts of the mountain slopes which are exposed to regular sea-winds, are covered with a belt of forest below a belt of bamboos. And there is still a large export of ivory from the Uganda forests.
4. On the plateau generally millet and cassava are the most important cultivated plants, and there are magnificent cattle pastures.
5. In the western trough, where the heat is very great owing to the low elevation, the rainfall heavy, and the soil very fertile, whole districts are covered with groves of bananas.

N.B.—Ivory, rubber, and cattle are the most valuable exports.

7. The occupations of the people naturally vary with race and situation. Cf. pp. 264, 267.

1. The cattle-rearing is mainly in the hands of Hamitic intruders from the north—especially the Masai, who live to the east of the Victoria Nyanza—and Zulu intruders from the south; and the inroads of these two bodies of intruders have greatly discouraged the more settled, *i.e.* agricultural, modes of life.
2. The Arab and Hindu population on the coast is composed entirely of traders—mainly in ivory and slaves; and their example has been followed by their nearest Bantu neighbours, *i.e.* the tribes between Tabora and Lake Rukwa.
3. In the west, where the population consists almost entirely of Bantu negroes, *e.g.* Uganda, and on the coast-lands, where the climate is so favourable, agriculture is the more usual occupation; but both the races and their occupations are mixed, the British territory being healthier and more settled than the German.

8. British East Africa dominates the head waters of the Nile, and—through Zanzibar—almost all the coast.

1. Uganda is not very healthy, but is remarkably fertile, and produces excellent coffee; and the new railway from Mombasa will convert its political centres, *e.g.* Mengo, Kampala, and Entebbe, into really important commercial centres.
2. All the centre of the country abounds in magnificent pasture, especially between Mount Kenia and the Victoria Nyanza; and the double advantage of lake navigation and railway transport will give a great impulse to the development of places like Ukassa and Ukala.
3. The coast-lands, especially between Taveta and Vitu, produce large quantities of rubber, which is exported *via* Wanga, Malindi, and Lamu; but most of the trade of the country goes through Kismayu northward or Mombasa southward.
4. Mombasa, on a coral island joined to the mainland by a railway bridge, is the best natural harbour on the East African coast, and will be further benefited by the Uganda railway. As the bulk of trade still gravitates instinctively to Zanzibar, the old centre, Mombasa (with Kilindini) is, in the meantime, much more important than Kismayu; but the Juba Valley is a natural 'Line of Least Resistance.'
5. The importance of Zanzibar is largely due to its long monopoly of the East African slave-trade; but it has a splendid central position opposite some of the best natural routes inland, and is extremely fertile. The city of Zanzibar stands on the west side facing the mainland, where its shallow roadstead is sufficiently sheltered by the island itself to make a fairly good harbour.

N.B.—The revenue of Zanzibar—as of its neighbour and dependency, Pemba—is mainly derived at present from a single crop, cloves, which are unusually risky to cultivate; but copra and chillies are becoming important.

9. German East Africa is much less healthy than the British territory, but has better routes inland.

1. The healthiest parts are the Karagwe highlands, which have the advantage of the lake port of Bukoba, and the Livingstone highlands, which have a similar advantage in Langenburg.
2. The best route inland is the old slave-track from Bagamoyo to Lake Tanganyika (Ujiji), *via* Mpuapua and Tabora; but there are also good routes from Lindi and Kilwa to Langen-

burg and the fertile Konde district, and from Pangani and Tanga to the Victoria Nyanza *via* the fertile Ruva valley and the natural sanatorium of Kilima Njaro.

3. Bagamoyo owes its importance only to its position between Zanzibar and the end of the old slave-route; its rival, Dar-es-Salaam, has a much better harbour, and is bound to become the more important railway terminus.

N.B.—The slave-trade was intimately bound up with the ivory-trade, and is dying a natural death with the extermination of the elephants.

WEST CENTRAL AFRICA.

1. WEST CENTRAL AFRICA may be roughly divided into three areas:—

1. A narrow strip of lowland along the Atlantic, generally known as Lower Guinea;
2. The wide circular basin of the Congo, one of the most clearly marked natural divisions of the whole continent;
3. The continuous belt of higher land which encloses this basin.

2. The coast strip extends from the Old Calabar to the Kunene, and is very narrow at the two extremities.

1. This is the only point of resemblance between the two: the north has a very hot, damp, even climate, with rivers of permanent volume flowing through richly-wooded valleys, *e.g.* the Lom; the south has a much cooler, dry climate, with rivers of very variable volume flowing through semi-desert regions, *e.g.* the Kunene.
2. The greater width of the lowlands between the Kwanza and the Ogowe is due mainly to the deltas deposited by those rivers, which have not, like the Congo, pace and volume sufficient to carry their burden of mud far out to sea. Consequently, the greatest width is at the mouth of the Ogowe, in the Lopez delta-promontory.
3. The vegetation corresponds exactly to that of the rest of the Guinea coast, except in the dry southern section—the oil-palm not being found south of the Kwanza.

3. The enclosing belt of highland that forms the water-parting is much higher in the west and the east than in the north and the south.

1. The southern highlands are much higher than the northern, but in both places the actual water-parting is extremely slight. Tributaries to the Zambesi or the inland drainage area of Lake Ngami rise quite close to, but *north of*, tributaries of the Congo; and tributaries to the Nile or the inland drainage area of Lake Chad rise quite close to, but *south of*, tributaries of the Congo.
2. On the east the enclosing highlands form the western edge of the Great Eastern Plateau, while in the west they rise to a height of 6500 feet in the Bihé plateau. This plateau is marked by parallel ridges of mountains, which make communication with the sea very difficult; the rivers are, except the Kwanza, absolutely useless for navigation owing to rapids, and the gradients are very trying for railways.

4. The Congo basin is the largest and much the most important area of low land in Africa, being the dried up bed of an inland sea, which must have been at least half the size of the Mediterranean.

1. The lowest part of this area lies between 5° S. and 5° N., where the low elevation, the equatorial heat, and the abundance of water, produce dense tropical vegetation and an almost impossible climate.

N.B.—Out of every *ten* European officials in the Congo State, *nine* die or are invalided home within three years.

2. The vile climate, the labyrinth of waterways, and the dense forests, make this area extremely difficult to govern; and the difficulty is increased by the absence of a common native language. The unfavourable conditions of forest life have also produced a most degraded type of people, dwarfish in stature and treacherous in conduct.
3. On either side of this area of equatorial rainfall and unvarying temperature, the elevation rises, and the rainfall decreases; and, as the forest consequently becomes much thinner, the climate improves both for man and beast.

5. The 'Congo' States include the German Kamerun, the French Congo, and the Congo Free State, the latter being much the most important.

1. The Congo Government professes to have restricted the liquor traffic, checked cannibalism, suppressed intertribal massacres, greatly impeded the slave-trade, and introduced regular work and education; but it is a commercial failure, mainly because it has too direct a view to profits.

6. The Kamerun district consists of a coastal area of dense forest and a fertile open plateau inland.

1. In addition to the dense forest and the hostility of the natives, communication inland has been made very difficult by the fact that all the rivers are ruined for navigation by rapids; and European settlement costs too many lives, even the Kamerun peak (13,000 feet) being haunted with malaria.
2. The climate and the volcanic soil produce, however, most luxuriant vegetation, the oil-palm and rubber-creepers being the chief natural products; and cacao and coffee have been planted with success, *e.g.* between Batanga and Yaunde.
3. The Adamawa district is famous for ivory, its forest-grown tusks being much more perfect and less brittle than those grown in open country; but the product is exported mainly *via* the Benué or the Saharan caravans. Cf. p. 262.
4. The trade of the country is done almost entirely through Victoria, on the fine natural harbour of Ambas Bay, the site of an old British Mission; but the capital is Buëa.

N.B.—The name of the country, as of the volcanic peak, is derived from a tidal estuary which the early Portuguese explorers christened Rio dos Camerones, 'The River of Shrimps.'

7. The French Congo is joined, *via* the Upper Ubangi and the Bagirmi district, to Lake Chad and the French Sudan.

1. Libreville is the capital, and has a fine harbour on Gabun Bay; but the best routes inland are *via* the Ogowe and the Kwilu rivers, and the latter makes Loango a more important harbour than Libreville.
2. All the inland towns of any importance are along the river valleys, *e.g.* Lambarene, Bué, Franceville, and Brazzaville; and, therefore, they are all centres for collecting palm-oil, rubber, and various dye-woods. The chief centres towards the Sudan are Yagusu, Mbanga, and Abu Gher, which export ivory and ostrich feathers, *via* the Sahara.

N.B.—The strip of Spanish territory round Corisco Bay is quite unimportant.

8. The Congo Free State is at present more interesting politically than commercially.

1. Until 1877 it was an entirely unknown land, and in 1884 it was a fully organised State, of nearly 900,000 square miles.
2. It has, however, enormous natural supplies of vegetable wealth, at present consisting mainly in oil-palms, rubber-creepers, and orchilla ; and, outside the forest area, its climate and soil offer every inducement to cultivation.
3. Coffee cultivation has already proved successful ; and the Bantu inhabitants are naturally tillers of the soil, and cultivate the natural products of the area—bananas, manioc, and cereals. Moreover, the forest area has been so recently opened up that it still produces abundance of ivory.
4. The development of the country depends almost entirely on the waterways ; and, therefore, all the important centres are on the great arteries. The most important is the harbour of Leopoldville on Stanley Pool, where all these arteries meet ; and next in importance comes New Antwerp or Bangala (=Liboko), on the great north-west bend of the main stream, and Kibonge, Nyangwe, and Kasongo, on the Upper Congo.
5. The most important tributary is the Kassai, partly because it gives such direct access, *via* its Sankuru tributary, to the head waters of the main stream, and partly because it drains the rich alluvial plain south of the line of rapids (cf. p. 248). Its chief centre is Luluaburg.
6. In the extreme south-east there is the important copper region of Katanga ; and in the extreme north-east King Leopold leases an important political area along the Nile, including Wadelai, Dufile, and Lado.
7. The development of the waterways depends in turn on access from the sea. The Congo is navigable for the largest merchant vessels from the out-port of Banana up to the in-port (and capital) of Boma, and large vessels can reach Vivi ; but between Vivi and Stanley Pool navigation is absolutely impossible, and a railway has been built from Matadi to Dolo (=Kinshasa).

9. Angola is the name now given to all the Portuguese possessions in West Central Africa.

1. The old territory of Angola was simply the coast between the Dande and the Kwanza, with the accompanying Hinterland.

The other old provinces now included under the general name of Angola are Loanda, Benguela, and Mossamedes; and there are also two new territories included under the term—Ambriz and Portuguese Congo.

The surface is exceedingly uneven, and most of it is at a considerable elevation. The northern part, between the Congo and Kwanza, is fully 3000 feet high throughout almost the entire distance from the coast to the Kwango; while the southern part, between the Kwanza and the Kunene, is even higher, attaining in the Bihé Mountains a height of fully 6500 feet. In both areas the surface is ridged with parallel mountain ranges running from north to south; and in both the plateau falls in a single steep slope to the Congo, but in three terraces to the Atlantic.

This arrangement obviously ruins the rivers for navigation; and no roads have been made to supply the want of waterways. The Kwanza, though not so long as the Kunene, is the only navigable river, having continuous navigation for small steamers up to Dondo (about 125 miles from Loanda); but the volume of water is very variable, and a company has a monopoly of the traffic, except for the Ambaca railway.

For this variable volume the climate is responsible,—the variation of temperature increasing with the distance from the Equator and from the sea, while the rainfall decreases from north to south. Thus, the Congo districts, both north and south of the river, are very warm and damp, and therefore covered with dense forest; and the climate is deadly. But up on the Bihé plateau the temperature ranges from 86° to below freezing point, and the climate is quite healthy for Europeans, *e.g.* at Humpata, Huilla, and Sa du Bandeira.

As the regular winds in the latitude of Angola are S.E. Trades blowing seaward, the humidity cannot be measured by the rainfall—at least, on the coast. For instance, at Loanda, the rainfall is scarcely 6 inches a year, and yet the sky is generally covered with clouds for 350 out of 365 days.

N.B.—Even at San Salvador, where the plateau is quite high enough to make a fairly good condensing medium, the rainfall is only 35 inches a year.

5. Under such circumstances the natural products are entirely 'tropical,' *e.g.* oil-palms, rubber-creepers, coffee, cotton, sugar-cane; but only two, the coffee and the sugar-cane, have hitherto been cultivated.

The coffee grows wild over all the northern area, especially in the Kwango and Kwanza basins; and it is cultivated in the Encoje district, in Cazengo and Golungo Alto. The great hindrance to the development of the industry is the

cost of human portage to Dondo. When the Ambaca railway is extended through Malanje, the healthier plateau between Cazengo and Cassanje will certainly be planted.

The sugar is mostly grown for the distillation of rum, for which the excessive humidity is very favourable—the proportion of molasses made in crystallising 1 cwt. of sugar varying with the humidity from 50 to 90 gallons. The cane, of course, requires more heat and moisture, and a lower elevation than the coffee, and is grown mainly along the coast and on the right bank of the Kwanza below Dondo.

In the drier and higher south there is excellent cattle-pasture, for the rivers are subject to regular floods, which cover their banks with rich mud ; and in the lower reaches of the Kunene the mud grows good cotton.

6. In addition to the extreme fertility of the soil, there is also undoubted mineral wealth ; but it is still undeveloped, mainly owing to expense of working. Iron has been worked from time immemorial by the natives of Cazengo ; there is gold in the Kwanza and copper in the Loge basin.
7. There are five chief outlets for the produce of Angola—the Congo, Ambriz, Loanda, Benguela, and Mossamedes.

Mossamedes exports the cattle and other wealth of the European settlers in the Kunene basin—guano and nitrate of soda from the semi-desert strip immediately behind the town—and fish, which are brought to the excellent harbour of Little Fish Bay by the cold Benguela Current. Cf. p. 13.

Benguela has only an open roadstead, but is the terminus of a good route to the fertile and healthy Bihé plateau. Its principal exports at present are simply the spontaneous products of the coast, *e.g.* india-rubber and wax ; and it is likely to be entirely superseded by the good harbour of Lobito Bay, the terminus chosen for the 'Benguela'-Katanga railway.

Ambriz, like Benguela, is an open roadstead which would be useless except for the fact that tempests are very rare. It owes its importance entirely to its good route up the Loge Valley to the coffee plantations of Encoje.

The 'Congo' ports naturally export palm-oil, rubber, and ivory from the lowlands of San Salvador, Cazengo, and Cabinda, mainly from the ports of Landana, Cabinda, and Ambrizette.

Loanda is the natural capital. It is much the best harbour on the whole coast, being protected from the ocean swell and the dangerous winds (S.W.) by a small island ; it commands both the railway route to Malanje, *via* Ambaca, and the river route, *via* Dondo

THE ZAMBESI REGION.

1. THE Zambesi Region is simply a continuation of the Great Eastern Plateau, and includes part of that area already noticed ; but the characteristic features are all on a smaller scale.

1. The lake formation is still of two kinds—the shallow, circular kind, *e.g.* Lake Mwero and Lake Bangweolo, and the deep, elongated kind, *e.g.* Lake Nyasa and the old lake-bed of the Loangwa Valley.
2. The eastern buttress is still the higher and much the steeper, rising in Mount Mlanji to nearly 10,000 feet, while the Congo-Zambesi water-parting in the west can be scarcely distinguished from the uniform surface of the plateau.
3. The wet winds still come from the east, and the shorter distance from the sea compensates for the lower elevation of the mountains for condensing purposes.

2. The general slope of the plateau is marked by the general trend of the rivers and by the vagueness of the water-parting.

1. It is so level in the west that branches of the Kwando seem to drain indifferently into Lake Ngami or the Zambesi, as streams between Lake Mwero and Lake Bangweolo drain indifferently into the Congo or the Zambesi.
2. All the main tributaries, *e.g.* the Kafue and the Loangwa, the Sanyati and the Panyami, have a distinct westward trend for a large part of their course ; and even the main stream, under the name of the Liba, at first flows westward.
3. In the east not only is the surface broken by numerous isolated hills or 'kopjes,' but there is a definite mountain system running north and south (cf. the Matoppos Hills).

3. The Zambesi itself may be naturally divided into three portions of distinctly different level.

1. The Upper Valley ends at the Victoria Falls. Above the falls there is a magnificent waterway, especially after the

confluence of the Kwando and on the 'Liambai' portion of the river ; but navigation is completely stopped by the Gonyé Falls.

2. The Central Valley, between the Victoria Falls and the Kebra-basa Rapids, is less useful than the upper one, mainly owing to the pace of the tributaries from the high escarpment on each side, and to the number of rapids which become unnavigable at low water. It is also the area most infested with the dreaded tsetse fly.

N.B.—This pest is harmless to men, but fatal to horses and cattle, and has therefore encouraged the slave-trade ; but it has disappeared elsewhere in Africa with the disappearance of big game, and may do so here.

3. The lower reach of the river from the Kebra-basa Rapids to the sea is a fairly good waterway, but the low level and the abundance of alluvium cause it to be obstructed by shifting sand-banks—the residue going to make the deadly delta. This section is, however, the most important because it receives the great Shiré tributary, which is itself navigable up to Lake Nyasa except for one series of rapids. It also contains the Portuguese stations of Sena, Tete, and Zumbo.

N.B.—The Chindé is the only really useful passage through the delta, but it is very unhealthy and simply alive with mosquitoes.

4. The coast-land is naturally divided by the Zambesi into two dissimilar areas.

1. The northern area is much the broader and the higher ; it is broken by steep hills and mountain ridges ; and it is crossed by rapid shallow streams, *e.g.* the Lurio.
2. The southern area has a more or less uniform low level, which greatly affects the character of the rivers, *e.g.* the Pungwe, the Sabi, and the Lower Limpopo—the Pungwe providing much the easiest access to the Mashona plateau.
3. These lowlands have, of course, much more luxuriant vegetation than the dry elevated plateau behind them, which in the south-west becomes mere arid steppe ; but their latitude puts them beyond the influence of the Equatorial rainfall, and therefore the jungle is nowhere very dense.

5. Most of the coast-land does not strictly belong to the Zambesi basin, but it has a political unity—belonging entirely to Portugal.

1. Like the corresponding long strip of Angola, it has been utterly neglected by the Portuguese ; and all its old centres are being replaced by new ones that are being developed

by the transit trade to British Central Africa. Thus, Quillmane is being replaced by Chindé, Sofala by Beira, and Inhambane—except for rubber—by Lourenço Marques.

2. Mozambique is the most important town in the north, and gives its name to the whole province north of the Zambesi. Like so many African ports, it is on an island; and the island shelters the harbour of Mosuril Bay (cf. Mombasa). Besides its through trade to British Central Africa, it collects oil, rubber, copra, wax, etc., from little neighbouring ports, *e.g.* Ibo.
3. Lourenço Marques, which gives its name to the whole province south of the Zambesi, has a magnificent harbour on Delagoa Bay, sheltered by a tongue of land from the S.E. gales, and with easy access to the Transvaal; and it is the terminus of the most important railway in East Africa. Beira also owes its importance to its easy access inland by rail—up the Pungwe valley to the Mashona gold-fields, *via* Umtali.

N.B.—Lourenço Marques is extremely unhealthy, being built in the middle of a swamp.

6. British Central Africa has been developed from the comparatively healthy Nyasa highlands, *via* the Shiré southwards and the Stevenson Road northwards.

1. The Stevenson Road was the natural result of Dr. Livingstone's work, but the whole expense of it from Lake Nyasa to Lake Tanganyika was defrayed by Mr. James Stevenson.
2. The earliest settlement was at Blantyre, but the capital is now Zomba; and the trade-posts of Port Herald and Chiromo are connected with Blantyre by rail, with a 'free-zone' at Chindé (Portuguese).
3. The native trade in spontaneous products, especially the ivory of Kambombo and Senga and the rubber of Bandawe, has been developed, and various tropical and semi-tropical plants have been cultivated, *e.g.* sugar and cotton; but the staple product is coffee, and Nyasaland produces the best coffee in the market, though the area for it is limited.

N.B.—There is also a first-rate harbour close at hand, for the Bandawe district, in Nkata Bay; but there is great need of a railway to get the coffee out of the country before the rains, which have spoilt many a fine crop.

7. Rhodesia is the unofficial name usually given to the important Matabili and Mashona plateaus, which form Southern Zambesia, and two other areas to the north.

1. The importance of this area is due mainly to the fact that its height and its latitude make it more suitable for Europeans than any other equal area of tropical Africa.
2. The surface is mainly one continuous plateau ridged in the south by the Matoppo and the Umvukwe Mountains, and rising towards the east, though the Zambesi itself drains eastwards.
3. The natural slope makes the plateau fall much more steeply towards the sea than inland; and, as the seaward face, of course, also gets the heaviest rains, the deep eastern valleys, *e.g.* those of the Mazoe and the Sabi, are covered with very fertile alluvium washed down from the steep escarpment.
4. The gentle westward slope ends towards both the Zambesi and the Limpopo in low veld, which is magnificent natural pasture, though the presence of the tsetse-fly makes the Zambesi veld useless in the meantime.
5. The rest of the country is between 4000 and 5000 feet above the sea, which makes it particularly healthy, and is well watered, fertile, and rich in minerals.
8. The wealth of the area lies at present mainly in grain and gold, but the northern areas are undeveloped.
 1. The rich alluvial valleys along the eastern escarpment produce wonderful crops of all kinds of tropical plants, especially rice, sugar, and cotton; but the staple products of the country are maize and Kaffir corn.
 2. The presence of hemp and tobacco, as well as the cotton, growing wild, *e.g.* in the Hanyani, Umquadzi, and Mazoe valleys, proves that both soil and climate must be admirably adapted to fibres; and, as the country is being developed mainly by a mining population, the tobacco will probably become extremely important.

N.B.—The natives smoke the hemp as well as the tobacco, but hemp-smoking causes certain death within quite a few years.

- 3. The watershed is mainly granite, but is intersected by areas of the best possible formation for gold, *i.e.* quartz and blue slate; the chief rivers have abundance of water, and the 'mopani' bush provides sufficient timber for successful mining; and there is good transport by rail *via* Bulawayo and the Cape, and *via* Umtali and Beira.
- 9. The Mashona plateau is rather the higher, healthier, more fertile, better watered, and richer in minerals; and its natives are distinctly the more peaceful and industrious.

1. The Matabili are savage warriors who did not allow any real prospecting for gold, and who drove the Mashonas up into the lonely valleys of the north-east, where they could build cities of refuge on impregnable peaks of granite.
2. The Mashonas are peaceful to cowardice, and have worked both the mineral and the agricultural wealth. For instance, they manufactured at Mchesa the excellent hematite iron found in the Umquadzi valley; they wove 'blankets' out of the wild cotton, and dyed them with the wild indigo; they even made string out of one kind of bark, and mixed another kind with saltpetre to make a poor sort of gunpowder.
3. The towns are almost entirely centres of mineral wealth. The two great political centres are Bulawayo and Salisbury, at opposite ends of the water-parting; other towns are Selukwe, Gwanda, Gwelo, Victoria, and Hartley, and important centres are springing up along the railway to the Victoria Falls, which runs through the rich Wankie coalfield.

N.B.—The ruins of Zimbabwe are possibly of Persian origin, but the widespread traces of old gold-workings have caused them to be identified—most improbably—with the Ophir of King Solomon.

CALMS OF CAPRICORN.

1. THE Calms of Capricorn, like the Calms of Cancer, are marked by a stretch of desert.

1. The Kalahari desert, like the Sahara, is caused entirely by the absence of rain; and its sandy surface, like that of the Sahara, is due to the disintegrating force of the great changes of temperature from day to night.
2. It is comparatively small, because the breadth of Africa at the South Tropic is not much more than one-third of its breadth at the North Tropic; but it extends actually over an area as large as England, and its influence is practically felt from Lake Ngami to the Orange River, and from Palapye to Walvisch Bay.
3. Like the Sahara, it merges towards the Equator in an area of inland drainage, which is connected with a series of salt pans; and Lake Ngami, like Lake Chad, is fed by a stream which flows from the moister regions nearer the Equator.

4. Like the Sahara, it extends westward in desert or semi-desert form to the very shore of the Atlantic ; but the Limpopo, like the Nile, wins from the desert its own valley in the east.
5. On the other hand, the Kalahari desert is not only much smaller, but also distinctly less arid, than the Sahara ; it has larger supplies of subterranean water, and is widely covered with coarse grass between the stretches of sand.

2. The whole area between the Limpopo and the sea is divided between Britain and Germany.

1. The most important part of the German territory is the strip through the British territory by which Damaraland has access to the Zambesi ; the most important part of the British territory is the hinterland of Walvisch Bay, which dominates the trade of German South-West Africa.

3. German South-West Africa consists of a series of terraces rising eastward into a definite range.

1. The highest summit, Mount Omutako, is about 7500 feet high ; and the considerable average height of the whole country gives it more rain (about 18 inches a year) than might be expected in such a latitude off the cold Benguela current.
2. The rainfall is, however, practically too small everywhere for agriculture, though the Damara highlands encroach on the moister regions of constant equatorial rainfall ; and, therefore, cattle-rearing is the only hopeful industry except the copper-mining in Great Namaqualand.
3. Thanks to its central position, the fairly permanent volume of the Swakop River, and the command of the trade-routes converging on Walvisch Bay, Otyimbingue has been made the political centre ; missionaries have established stations all over the healthy highlands, *e.g.* Rehoboth, Beersheba, Bethany ; and an attempt has been made to develop the harbours of Sandwich and Angra Pequena (= Luderiz).
4. Walvisch Bay is, however, the only good harbour, and commands all the best routes into the interior—up the two watercourses of the Swakop and the Kuisip. Moreover, as the distance from the Bay to Vryburg is less than 800 miles, a railway between the two places *via* Sandfontein would save two days' journey by sea and one day's journey by rail over the present Cape route to the Witwatersrand

The use to Britain of such an isolated settlement—no larger than Berwickshire or Bedfordshire—is comparatively so small, and the possession of it so essential to Germany, that it will probably be exchanged for some portion of German territory elsewhere in Africa.

N.B.—The most useful portion to Britain would be a strip along the north-west corner of German East Africa, which would bring the Uganda boundary to the north end of Lake Tanganyika.

4. The importance of the British territory is due to the fact that it contains part of the great 'Cape to Cairo' route along the Eastern Plateau.

1. The communication is made exceptionally easy by the level surface and by the artificial character of the boundaries; but, though the latter present no physical obstacle to commerce, the Orange, the Limpopo, the Vaal, and the Marico rivers form very convenient political boundaries.

N.B.—The Molopo performs a similar service between the old Crown Colony, or British Bechuanaland, and the Protectorate.

5. British Bechuanaland is a fine plateau about the size of England, rising to a height of 5000 feet.

1. This height and the dry air make it very healthy; and, as there is also excellent pasture, the plateau forms an important basis for the British position northwards to the Zambesi.
2. Politically, it is now part of Cape Colony; but, geographically, it has more in common with the Bechuanaland Protectorate, and falls naturally under the area of the Capricorn Calms.
3. The country is divided into two unequal parts by the line of hills which run due north from Kheis to the Molopo. West of the hills the land is a waste, forming part of the Kalahari desert; it has no rain except during occasional thunderstorms; and its vegetation is largely limited to plants with deep tuberous roots, in which they can store up the little rain that does fall. (Cf. p. 31.)

The eastern part is also very dry; but the soil is naturally fertile, the summer rains (25 inches) might be stored, and irrigation produces very large crops of maize and millet, especially in the Hart basin.

4. The political capital is Vryburg; but both Taungs and Mafeking are more important, as they have the advantage of rivers—the Hart and the Molopo—as well as the railway. Taungs

trades (in maize, wool, hides, cattle, etc.) with Kimberley; and Mafeking, which is the largest town, controls the trade with the Protectorate and the Transvaal.

N.B.—The only town of any size away from this eastern border is Kuruman, which collects salt from the desert. Cf. Tandeni in the Sahara.

6. The Protectorate, like the Colony, is divided into two unequal parts by a continuation northwards of the same line of hills.

1. West of the hills stretches the Kalahari desert, in which the bushmen manage to keep herds of native sheep and goats; and there is also some mineral wealth, including salt and gold. Eastward the country gradually changes from desert into valuable pasture, *e.g.* between Molepolole and Palachwe, and then into valuable agricultural land, *e.g.* between the Notwani and Limpopo rivers, where there are special facilities for irrigation.
2. There are only two towns of importance, the frontier market of Kanya and the political centre of Palachwe. The latter, King Khama's capital, is quite a new town, but has a population of over 30,000. Shoshong used to be the capital, but in 1889 Khama transferred his town bodily to the healthier site of Palachwe, where both the air and the water are of the purest, and where the porous sand and the dry air materially assist sanitation.

7. The old Dutch Republics consist of a broad high plateau, with an undulating surface, entirely cut off from the sea by the Draken-Berge.

1. The plateau is known as the Veld; the soil is generally sandy, the surface is grassy, and the climate is extremely healthy.
2. Two-thirds of the whole is occupied by the 'Transvaal' area, which is about the same size as the United Kingdom, while the Orange River Colony is about the size of England.
3. Though most of the area falls within the belt of Capricorn Calms, its nearness to the ocean and the height of the Draken-Berge give it a far better water supply than Bechuanaland.

8. The Transvaal area is naturally divided into three areas—the High, the Middle, and the Low Veld.

1. The High, or Hooge, Veld is an area, about the size of Ireland, between the Vaal River and the Magalies Moun-

tains; it is destitute of trees, and very dry during the winter months; but it is wonderfully bracing and healthy, and has splendid sheep pasture. It is also extremely rich in gold.

2. The Middle Veld, or 'Garden of the Transvaal,' is a rather smaller area of lower elevation, crossed by detached ranges, *e.g.* the Waterberg and Hanglip, broken by wooded 'kloofs' or gulleys, and drained by the headwaters both of the Limpopo and of the Olifant.
3. The Low, or Bosch (Bush), Veld averages nearly 2000 feet lower than the Middle Veld; and, as it is also much better watered than the rest of the country, it is densely forested. This makes it distinctly unhealthy; and, as the bush is haunted by the tsetse fly, stock-rearing is impossible.

9. The occupations of the people vary with nationality and with the different Velds.

1. On the High Veld the Dutch are almost entirely occupied with sheep and horse farming; on the middle Veld they raise cattle and grain, especially maize (mealies); and in the tropical Bush Veld they are mainly engaged in planting coffee and sugar-cane.

N.B.—Swaziland may be reckoned as a Middle Veld region.

2. The various foreigners, mainly British, were attracted to the country by its mineral wealth, which is largely confined to the High Veld. Coal exists in considerable quantities, *e.g.* round Boksburg, and is very useful in the almost complete absence of timber; but gold is the great staple—over £16,000,000 worth having been produced in 1904.
3. The richest gold-fields lie along the Witwatersrand, *i.e.* the hilly ridge which divides the Orange basin from that of the Limpopo; and the great centre is Johannesburg, which since 1885 has sprung up into a city of 160,000 inhabitants. There are also rich fields amongst the Draken-Berge valleys, *e.g.* the De Kaap, on which the towns of Barberton and Lydenburg have sprung up.

10. The towns, therefore, are of two kinds—mining and farming.

1. The political centres are generally little pastoral towns on the High Veld, like the old and present capitals of Potchefstroom and Pretoria; the centres of mixed farming are even smaller and generally on the Middle Veld, *e.g.* Rustenburg and Nylstroom, Utrecht, and Vryheid; the plantation settlements are entirely in the Low Veld, *e.g.* Valdesia.

2. The mining and railway centres, on the other hand, are already big cities or rapidly becoming so, *e.g.* Heidelberg and Middleburg, Leydsdorp and Krugersdorp, Komati Poort and Elandsfontein.
3. The commercial capital is Johannesburg, which has direct connection by rail with five different railway termini round the South African coast—Cape town (about 1000 miles), Port Elizabeth (about 700), East London (665), Durban (437), and Lourenço Marques (about 400).

N.B.—All these railways have a common trunk, the eleven miles between Johannesburg and Elandsfontein, which is the only double line in the country.

11. The Orange River Colony is almost a dead level, broken only by kopjes in the south, and it is entirely pastoral and mining.

1. The dry air and want of water, which practically prohibit agriculture, make the climate exceedingly healthy, especially for persons with weak lungs; and, for the same reason, the country produces magnificent wool and ostrich-feathers.
2. There is also considerable mineral wealth, including diamonds to the west of Fauresmith and coal between Kroonstad and Heilbron.
3. The chief centres of population are Bloemfontein, the capital, and Winburg, both on the main line north from Port Elizabeth and East London to Johannesburg; Harrismith is an important frontier junction on a branch of the main line from Durban to Johannesburg; and Ladybrand and Smithfield are cattle-markets amongst the rich pastures of the Caledon valley.

SOUTH AFRICA.

1. CAPE COLONY is of immense value to the British Empire, because it commands the most important trade-route in the 'water,' *i.e.* the southern hemisphere.

1. Cape Town is the only harbour of real importance between St. Helena and Mauritius for India-bound vessels, and between St. Helena and Albany for vessels in the Austra-

lasian trade. It is, therefore, the only convenient coaling-station for vessels before they enter the latitudes of 'The Roaring Forties.'

N.B.—These two facts make the possession of Cape Town a sheer necessity for an empire which has the greatest navy in the world, and the security of which depends on its naval supremacy.

2. Cape Colony is three times as large as Great Britain, but has not as much coast as England alone ; and very few of the harbours are naturally good.

1. The reason for this is the immense amount of alluvium brought down by the great rivers of the continent, and distributed by various currents along the coast.
2. The best natural harbour is Saldanha Bay, about 60 miles north of Cape Town ; but as it has neither supplies of fresh water nor communication inland, it has no value except as a refuge.
3. Table Bay is exposed towards the north-west, and is therefore not quite safe during 'Anti-Trade' gales ; but it is of so much importance to the British mercantile marine that extensive harbour works have been constructed, and it has good communication inland.
4. Simon's Bay, by which also there is a good approach to Cape Town, is large and sheltered ; but the entrance is dangerous, because Cape Agulhas extends a long way seaward beneath the surface of the water, strong currents sweep round the Cape, and the meeting of the cold Benguela current with the warm Mozambique current causes dense fogs. Cf. p. 240.
5. The best harbour on the rest of the Cape coast is Algoa Bay ; but even that is exposed towards the south-east, the stormy quarter, and does not admit the largest vessels to Port Elizabeth. East London is also a good harbour, but Port Alfred and Mossel Bay are simply roadsteads.

3. Cape Colony is of typical African formation—a large plateau rising abruptly in parallel terraces from a moist coast-strip to dry flat-topped mountains like Table Mountain.

1. These so-called mountains are really the steep escarpment of the plateau, and run from east to west across the Colony.
2. The lowest terrace is very near the sea in the west and south, but towards the east retreats from 20 to 60 miles.

3. The third terrace leads to a plateau nearly half the size of England, called the Great Karroo—from the Hottentot name for a shrub that grows on it ; and, as the average elevation of it is 3000 feet, the rainfall is too slight for anything except sheep pasture.

4. The Nieuwveld Mountains, a continuation westwards of the Draken-Berge, form the water-parting of the country.

1. The rivers that flow northward from them are fed mainly by thunder-rain ; and they are, therefore, very variable in volume. Cf. the Orange.
2. The southward rivers, *e.g.* the Gauritz, Gamtoos, and Sunday, vary much less, and might be very useful for irrigation ; but the sudden and violent floods to which they are subject, cause them to plough such deep channels that irrigation by gravitation—the only cheap method—is practically impossible.
3. The range rises in height (under different names—Winter-Berge, Sneeuw-Berge, and Storm-Berge) towards the east ; and this increase in height is accompanied by an increase in the amount of vapour brought landwards—off the warm Mozambique current. Consequently, the rivers, *e.g.* the Great Fish River, begin to have more permanent volume.

5. The climate naturally changes with the height and the distance from the sea, and changes still more importantly with the longitude.

1. The rains in the east fall in summer, while those in the west fall in winter ; and, therefore, *e.g.* at Grahamstown, the rain cools the heated air, and the clouds temper the sun's rays.
2. The damp heat of the S.E. coast, *e.g.* between Port Elizabeth and East London, is as bad for Europeans as the consequent sour grass is for stock ; but the pure dry air of the inland heights, *e.g.* at Colesberg and Aliwal North, is magnificently healthy.
3. The cold Benguela current affects the climate unpleasantly in the west, and decreases the rainfall ; and, therefore, most of the towns are in the south-east, where the rain is sufficient for general agriculture.
4. The actual rainfall varies from about 40 inches at Grahams-town to about 5 in the north-west of the Great Karroo ; but there is a local rainfall of 30 inches at Cape Town owing to

the height of the condensing medium (Table Mountain = 3600 feet) and its nearness to the sea.

5. In connection with this rainfall there is an extensive and valuable salt industry. Cf. the salt-pans in the Sahara and the Kalahari deserts.

6. With such a scanty rainfall, it is obvious that agriculture must be extremely limited.

1. The average rainfall over the rich wheat lands in the Eastern Counties of England is not more than 30 inches ; but on a plateau in the latitude of Cape Colony, where both filtration and evaporation are very rapid, 60 inches would not be too much. Even in the districts which have the heaviest rainfall, irrigation is a necessity ; and this is rendered difficult and expensive by the depth of the river-beds. Cf. § 4 (2).
2. Wheat and maize are the only grain-crops, the wheat being naturally grown in the drier and colder south-west, while the maize is grown in the damper and hotter south-east. The best wheat comes from the Malmesbury plain ; most of the maize, or 'mealies,' comes from the district between Uitenhage and King (William's Town).
3. The vine is, however, eminently adapted to such a dry climate, and is said to grow more luxuriantly in the south-west than in any other part of the world. The most productive vineyards are on the warm, dry slopes of the lowest terrace, *e.g.* at Paarl, Stellenbosch, Constantia, and Wynberg ('wineburg'). The proximity of these places to Cape Town, the ease with which cork-dust can be imported from Lisbon, and the nearness of Cape Town itself to London, have caused a large export of grapes. Cf. p. 308.
4. Tobacco also grows well in the south, especially in the rich limestone valley of Oudtshoorn, where the shelter of the Zwarte-Berge and the Lange-Berge on the north and the south, the number of streams, the proximity to the sea, and the presence of extensive forests between the Lange-Berge and the sea, seem to guarantee permanent success to the planters.

N.B.—In such a treeless country these forests are specially valuable, and supply wood for wagon-building.

7. The pastoral wealth is much greater, therefore, than the agricultural, and is mainly in sheep and goats.

1. The coast-lands, however, are suitable for cattle, especially in Transkei and Pondoland ; and there is a large demand for

transport oxen for the wagon-traffic over the roadless plains of the interior.

2. The goats are much more numerous than the cattle, and are of two kinds—native and Angora. The former are very hardy, but the latter are much the more valuable. Most of them are kept on the Upper Karroo and the eastern half of the Great Karroo, especially round Richmond and Graaf Reinet; and mohair to the value of £600,000 is exported annually *via* Port Elizabeth.
3. The sheep, like the goats, are of two kinds—native and Merino; and in the very dry north-west the native is even preferred. Elsewhere the Merino is the most valuable animal in the country, and wool is exported to the value of about £2,000,000. The most important sheep farms are also on the Great Karroo, and there is great mortality amongst the sheep in a dry season; but this is mainly due to bad farming—*e.g.* overstocking the land, keeping the kraals dirty, or wearing out large areas of good pasture by always bringing the sheep to the same kraal by exactly the same route.
4. Ostrich-farming requires special knowledge and experience; and, as profits are peculiarly dependent on the caprices of fashion, only wealthy capitalists can risk the possible heavy losses or the long waiting for gains. The centres of the industry are Uitenhage and Grahamstown.

8. The scarcity of fuel, which will probably prevent the Colony ever having any important manufacturing industries except tanning, has also hindered the development of the mineral wealth.

1. Coal does exist in considerable quantities in the Storm-Berge, *e.g.* at Indwe and Cyphergat, and can be easily *quarried* out of the hillsides; but it is of very poor quality.
2. Copper is also found in various parts, and exists in valuable quantities in the old rock of Namaqualand. The richest deposits are at Ookiep, which is connected by a tramway with the roadstead of Nolloth.
3. Diamonds are, however, the great mineral product, and realized nearly £6,500,000 in 1904. The chief mines are in the blue clay of Griqualand West, where archaic and mesozoic formations meet in the valley of the Vaal. Kimberley is the centre of the industry, and lies in the natural Line of Least Resistance for the transcontinental railway.

9. The other important towns of the Colony are generally stations on the great trunk lines, which run from the various ports to the diamond and gold fields of the north.

1. In the North-Eastern Province, where all these lines converge, De Aar, Naauw Poort, Middleburg, and Cradock are all important junctions ; the lines of the Cape Town district converge on Worcester, as those of Port Elizabeth and Port Alfred converge on Alicedale ; and Tulbagh, Beaufort West, and Cathcart command various passes by which the railways climb the terraces.

10. Natal is two-thirds the size of Scotland, but it has only 200 miles of coast and only one good harbour—on Port Natal.

1. This bay, however, is by no means an ideal harbour, as it has a shifting bar and is quite shallow ; but, as it is the best harbour on the coast, it monopolises the trade of Natal, and does a large share of the Free State and Transvaal trade. Durban itself is well sheltered by a spur of land that juts out south-eastward into the bay.
2. The western boundary is the natural obstacle of the Draken-Berge, which vary from 6000 to 10,000 feet in height. Consequently, the passes across the range, though few and steep, have become very important. The Van Reenens Pass gives railway access to the Orange River Colony, and the pass below Majuba Hill gives it to the Transvaal ; and there is, fortunately, a valuable coalfield between the two along the Natal slope of the Draken-Berge.

11. The surface both of Natal proper and of Zululand, like that of Cape Colony, rises in steep terraces.

1. The lowest terrace makes Pietermaritzburg 2000 feet higher than Durban, and the highest terrace provides the Tugela River with a waterfall of 2000 feet (in three plunges).
2. The height of this innermost terrace, which is practically the Draken-Berge, and its nearness to the warm Mozambique current, guarantee much more rain than in Cape Colony. Even at Ladysmith, which is 100 miles from the sea, there are at least 24 inches annually.
3. The steepness and the frequency of the terraces, though they make continuous navigation impossible even on the

Tugela, offer special facilities for motive power and irrigation, or for ambuscades in war.

12. The climate is not nearly so healthy as in Cape Colony; the heat is great, especially in Zululand, and the rain comes mainly in the hottest season.

1. The smaller rainfall in winter is usually sufficient, as the sun's heat is less; and the summer storms bring with them densely-clouded skies, which shade young plants from the sunshine.
2. The torrential character of the rains, however, has cut up the surface, as in Cape Colony, with deep 'kloofs'; but, as the soil is neither so bare nor so dry as in Cape Colony, it is not washed away so easily.
3. Of course, the varied surface and latitude cause variety of climate. The coast-strip is distinctly unhealthy, especially in Tongaland, and has very even temperature; the uplands are perfectly healthy, and have snow and ice.

13. The products and occupations vary with the soil and the climate.

1. The coast-lands have semi-tropical climate and vegetation, and are generally richly charged with organic matter in the form of decayed vegetation; this helps to keep the soil moist, to assimilate plant-food from the air, and to add to this food by generating carbonic acid.
2. These conditions are inimical to Europeans; but the plants which they suit, *e.g.* maize, sugar, and tea, are such as necessitate the use of cheap coloured labour. And, as the Zulus are too proud and the Kaffirs too lazy to work, coolies are imported; but wide planting of eucalyptus is greatly improving the climate for Europeans, and the natives keep cattle. Cf. p. 306.
3. The 'Midlands' contain a wide stretch of rich loamy soil from Greyton to Richmond, which is adapted for mixed farming. Horses and cattle are raised in large numbers, and are quite free from the lung diseases which affect them on the sugar plantations, and which necessitate the use of mules; the soil is damp enough for maize especially round Pietermaritzburg, and the climate is dry enough for wheat.
4. The 'Uplands' are naturally most suited to sheep and goats, the goats thriving on the rougher land and requiring the

less attention. The climate is, however, not suited to the natives ; and, therefore, the mohair trade is—unlike the cattle trade—entirely in the hands of Europeans.

5. These Uplands are, however, most important for the coal which is found in their palaeozoic formation. The most valuable mines are on the upper waters of the Buffalo basin, especially at Newcastle and Dundee.

N.B.—The Buffalo basin also contains the historic sites of Majuba Hill, Rorke's Drift, and Isandhlana ; Laing's Nek, Glencoe, and Elandslaagte.

14. The chief commercial centres are, therefore, on the coast, while the chief political centres are on the first terrace, and the chief strategic points are on the foothills of the Draken-Berge and their spur, the Biggars-Berge.

1. Besides the port of Durban, Isipingo and Verulam are sugar centres, Stanger and Port Durnford are interested in the tea-planting along the Lower Tugela, and villages are springing up round the fertile shores of Lake St. Lucia.
2. Besides the political capital of Pietermaritzburg, Ulundi is the old capital of Zululand, and Ekowe is the residence of the Chief Magistrate.
3. Ladysmith is the junction for the Orange River and Transvaal traffic, and the commercial centre of the mining district. This accounts for its importance in the late war.

15. Basutoland is a high plain about twice the size of Yorkshire, and produces the best wheat in Africa.

1. The reasons for this are that the soil is naturally fertile, especially round Maseru ; the country is very well watered by the Caledon and the Orange rivers ; and the height of the Draken-Berge entirely keeps off the summer storms from the sea.

AFRICAN ISLANDS.

1. MADAGASCAR is not only much the largest of the African islands, but also one of the largest islands in the whole world. Cf. p. 238.

1. It is nearly three times the size of Great Britain, and—excluding Greenland—is surpassed in area only by New Guinea and Borneo.
2. The Mozambique Channel is 250 miles wide, and reaches a depth of 1600 fathoms; and, as the island has several species of plant and animal peculiar to itself, *e.g.* the Traveller's Tree and the Lemur, it must have been separated from the mainland at a very distant date.
3. At the same time, the much greater oceanic depths beyond the island and elsewhere round the Continent, and the general structure of the island itself, prove that it must have been once united to the mainland; and the Comoro Islands supply a link.

2. Its structure is typically African, and reproduces the characteristic features of the Great Eastern Plateau.

1. It consists, generally, of a high plateau, surrounded by a low coastal plain; and the plateau is of old granite formation broken by volcanic peaks, while the plain is of new sedimentary formation.
2. The plateau rises towards the east, and then falls abruptly in terraces to a very narrow plain; while on the west it falls gradually to a much wider plain.
3. The water-parting runs north and south for about 1000 miles, and is marked by a line of extinct volcanoes, attaining, in Ankaratra, a height of nearly 10,000 feet; and, as it is so much nearer the east coast than the west, all the longest rivers, *e.g.* the Ikopa, Mangoka, and Ongulaki, flow westward.
4. To the west of this water-parting there is a deep parallel valley enclosed by steep cliffs of horizontal sedimentary rock; and amongst the most important group of volcanoes there are large lakes, *e.g.* Itasy and Alaotra.
5. The granite plateau is generally covered with grassy savannahs or park-land, while the coastal plain and the escarpment of the plateau are densely forested.

3. The climate varies with the height and with exposure to the S.E. Trade-winds.

1. The height of the plateau and the protection of the water-parting make the climate of the interior temperate and healthy; trees are rare, and sheep and cattle flourish.

2. As the east coast-lands face the S.E. Trades, they have a very hot, damp, deadly climate, which suits sugar and cotton admirably, *e.g.* between Makanoro and Tamatave; and the coral formation along the shore produces splendid pine-apples. Sugar also flourishes in the Comoro islands, especially in Mazotte.

N.B.—The French are planting eucalyptus round Tamatave to improve the climate. Cf. p. 303.

3. The forested eastern escarpment, with its heavy tropical rains and abundance of iron in the soil, is an ideal site for coffee and tea: and the forest, generally, produces rubber, ebony, and gum-copal.
4. In the south the island falls within the belt of the Capricorn Calms, and is comparatively barren; it is also comparatively healthy, even on the lower levels, *e.g.* south of the native centre of Fianarantsoa. Cf. p. 292.
5. Outside the plateau and the forested region, agriculture is the universal occupation, rice and maize being the chief crops; and it is mainly carried on by tribes of Negro extraction, who are greatly despised by the Hovas of the plateau—a yellow Malayan people.

4. The mineral wealth includes copper, sulphur, galena, and gold, as well as an abundance of iron.

1. This accounts for the skill of the people in metal work, especially in gold and silver; and such skill implies the existence of the metals in considerable abundance, though mining is still undeveloped.

5. The towns are mainly ports, and all the good ports are in the north.

1. The reason for this is that the coasts of the southern part of the island, like so much of the African coast, are singularly unbroken; but in the north there are several fine harbours, the finest being the land-locked bay of Diego Suarez.
2. The chief port at present is Tamatave, as most of the trade is done with the Mascarenhas; but Mojanga, with its 60 miles of navigation up the Ikopa, is rising in importance.
3. The French still keep Antananarivo as the capital; but its site—high up amongst inaccessible peaks on the head waters of the Ikopa—is more appropriate to the capital of the Hovas than to that of a European power.

6. The North Atlantic Islands, especially the Azores and the Canaries, were of great importance in the early days of geographical exploration.

1. They afforded ports of shelter, they supplied fresh water and food, and they tempted the explorers seaward.

7. The Canaries were known to the Greeks as 'the Fortunate Islands,' and they certainly are fortunate in scenery and climate.

1. They are mountainous volcanic islands, rising to about 6400 feet in Gran Canaria, 7700 in Palma, and 12,200 in Teneriffe; and their nearness to the mainland is marked not only by their dry climate, but also by such a typical African plant as the euphorbia.
2. Their lofty peaks make them famous for goats, their warm volcanic slopes grow splendid grapes, their coast-lands grow potatoes, bananas, and tomatoes for the London market, and the cochineal insect flourishes on the euphorbias and various kinds of cactus on the dry eastern islands.
3. Santa Cruz, the seat of the Spanish Government, is on the largest island, Teneriffe, which is nearly four times the size of the Isle of Man; but Gran Canaria contains the important coaling-station of Las Palmas. Ferro, as the most westerly land in the Old World, was used for a long time as the site of longitude 0°.

N.B.—The islands take their name from the number of wild dogs (Latin, *canis*) which were originally found in them.

8. The Cape Verde Islands are of little commercial importance, but have a fine harbour and convenient coaling-station on the barren island of St. Vincent.

1. Their latitude and the nearness of the Sahara cause them to suffer from drought, though they rise to a height of nearly 9000 feet in Fogo and Santiago. The latter island contains the political capital of Villa da Praia.

9. As Madeira does not rise above 6000 feet, and is much farther out to sea than the Canaries, it was not discovered till much later.

1. Its dry air and volcanic soil produce splendid grapes and other fruit; and its mild climate attracts invalids, especially

to the chief town of Funchal on the sheltered sunny south coast.

2. This influx of visitors led to a great industry in embroidery and wicker goods, and thousands of pounds' worth are exported annually; but the chief exports are 'Madeira' wine and fruit, and cork dust for the latter is easily imported from Lisbon.

N.B.—Cork dust is the best material for packing grapes in because it is very light, it has no taste or smell, and it does not transmit the moisture of any broken grapes. Cf. p. 109.

10. The Azores, like Madeira, belong to Portugal, and are so far from Africa that they ought not to be called African islands at all.

1. They are rugged and mountainous, the mountains of Flores being considerably more than 9000 feet. They are typical fruit islands, with a mild even climate and fertile volcanic soil; and their chief exports are oranges and pine-apples, the oranges coming mainly from the island of St. Michael.

11. Réunion, Mauritius, and its dependencies of the Seychelles and Rodriguez, are the highest points of a submarine bank.

1. Mauritius is a coral-girt, well-wooded area of volcanic hills, about three times the size of the Isle of Man, in the path of frequent cyclones; and it has, therefore, a heavy rainfall, and is an ideal site for sugar. All its towns are ports, and distil rum—Savanna, Mahebourg, Grand River, and the capital of Port Louis; Curepipe, on the water-parting of the Black River Hills, which run due north and south through the middle of the island, is a sanatorium during the summer rains.
2. Réunion is rather larger and considerably higher than Mauritius, rising in Piton des Neiges to 10,000 feet, and it has a very active volcano in Piton de Fournaise; but it is otherwise very similar. Like Mauritius, it grows various tropical products, including coffee, aloes (for fibre), and vanilla; but, as in Mauritius, the staple is sugar. The great height and the deep gorges of the interior compel each coast-land to export its own product, though there is a railway along the coast; St. Denis is the capital, and the chief port is Point-des-Galets near St. Pierre. St. Paul is on the west coast.

3. The Seychelles are a very beautiful archipelago, the home of the double coco-de-mer, which supplies their export of oil and copra. On the largest island, Mahé, vanilla is now being widely grown, and is exported from Port Victoria. Like the neighbouring coral group of the Amirante, the Seychelles have a delightful, if not very healthy, climate.

12. Ascension, St. Helena, and Tristan da Cunha are the peaks of solitary submarine volcanoes.

1. Tristan da Cunha and Ascension rise from the submarine ridge which divides the South Atlantic into an east and a west basin ; but, while Ascension, like St. Helena, is not 3000 feet high, Tristan da Cunha is more than 8000.
2. Ascension is so devoid of water that it is practically barren ; but it is noted for its turtles, which support a 'tortoise-shell' industry, and its little port of Georgetown is used as a naval depot for the British West African squadron.
3. St. Helena is well within the area of the S.E. Trades, and has plenty of rain ; but reckless destruction of timber has partly caused and greatly helped the washing away of soil by the rain, so that large areas are practically barren. The chief crop, as in Tristan da Cunha, is potatoes, and the chief industry is fishing. Jamestown, the capital on the leeward—*i.e.* north-west—coast, is a coaling-station.

13. There are four volcanic islands of considerable importance in the Gulf of Guinea—Fernando Po, Annobon, Prince's Island, and St. Thomas.

1. The first two belong to Spain, and the last two to Portugal. The largest and highest is Fernando Po, which rises to a height of 10,000 feet ; the next in size, St. Thomas, is not more than 7000. The soil is fertile, and the moist, hot, even climate produces all kinds of tropical plants. The chief towns are Santa Isabel on Fernando Po, and Cidade on St. Thomas.

ASIA.

Introductory.

1. ASIA has been the scene of some curious contrasts in civilisation and barbarism.

1. On the huge northern plains the conditions of surface and climate have forbidden the growth, still more the concentration, of any dense population ; and consequently they have not given the world any important civilisation or creed.
2. The rich river valleys, on the other hand, developed in very early times the civilisations typical of tropical and semi-tropical latitudes (cf. p. 16). The Mesopotamian influence, through the narrow strip of Mediterranean coast by which it spread westward, was most widely felt ; while the barriers of mountain and desert made the Hindostan influence most confined.
3. The natural poverty of the northern lowlands, and the gradual withering of even the poor pasture-lands by the drying up of large areas of water in Central Asia (cf. p. 314) attracted the hordes of pastoral nomads to these rich river-valleys ; and this was probably the cause, *e.g.* of the various Mongol descents on China, Russia, and even Hungary.
4. The hot deserts of the south-west have a special interest. Compared with the cold deserts of the north, they are even less bountiful ; but their requirements are also less, *e.g.* in the matter of shelter and clothing ; and they are less isolated. Compared with the river-valleys, they have a monotonous uniformity of scenery and products ; but their climate is healthier, and their measures of space appear boundless.

Thus, while the multiform animal and vegetable life of the river-valleys was reproduced in their multitudinous idols, combining all shapes and kinds of life in the same form, the three great monotheistic religions of the world are all of the desert—Sinai, Judæa, Arabia. All, too, are Semitic in origin; and all teach the great lesson of the desert—self-denial, “Thou shalt *not*.”

Surroundings.

1. As Asia has more than 50,000 miles of coast, with immense differences of latitude and longitude, it is practically useless to attempt to take a comprehensive view of the whole.

1. C. Chelyuskin is about 5350 miles from C. Romania, and the Dardanelles are nearly 6000 miles from Bering Strait.

2. Of the separate features, the peninsulas are the most remarkable.

1. They have a curious resemblance—generally on a gigantic scale—to those of Europe. Thus, the dry tableland of Spain is reproduced in the dry tableland of Arabia; Italy, with its highland peninsula and continental Alp-encircled plain, has its counterpart in India, with its Deccan plateau and the Himalaya-encircled plain of Hindostan—Ceylon being the counterpart of Sicily; the Malay peninsula, with its Archipelago and Sunda Islands, is not unlike the Balkan peninsula, with its Archipelago and Ionian Islands.

So, comparison of Kamchatka and the Okhotsk Sea with Scandinavia and the Baltic—like that of the Japanese Islands and their enclosed sea with the British Isles and the North Sea—can scarcely be called far-fetched.

2. The peninsulas comprise nearly $\frac{1}{2}$ of the whole area of the continent; and, as they are massive and compact, they do not appreciably affect the proportion of coast-line to surface, which is less in Asia than in either of the other northern continents, though greater than in any of the southern.

3. Another important feature is the series of gulfs on the east coast.

1. Asia had no ‘Mediterranean’ Sea to serve as a natural highway between her great southern peninsulas; before the

opening of the Suez Canal, the Red Sea only separated desert from desert, while the Persian Gulf separated desert from almost barren mountains.

2. The succession of archipelagoes off the east coast, on the other hand, has practically converted the Siam Gulf, China Sea, Yellow Sea, and Japanese Sea into one continuous inland sea, which has been since the earliest times the scene of a busy commerce—legitimate or otherwise. Cf. p. 17.
3. The only 'great drawback has been the climate. The typhoons of the southern seas and gulfs are notorious, while the Okhotsk Sea and the Kamchatkan Gulf are as much hampered by ice as the Baltic and the White Sea.
4. The numerous islands have been already referred to as forming the eastern 'shore' of this inland sea.
 1. Nearly $\frac{1}{10}$ of the total area of 'Asia' is comprised in these island groups; and in the south-east they form one of the most important boundaries of the continent, as the deep channel that flows between Bali and Lombok and on up the Macassar Strait is considered to separate 'Asia' from 'Australasia.' So, too, the narrow strip of the Sunda islands divides 'Indian' from 'Pacific' waters.
 2. The only Mediterranean island of any real importance is Cyprus (cf. Ceylon in the Indian Ocean), which consists of a long plain—the Mesorea—shut in on the north and the south by mountains, which cut off moisture from the interior. The central position of Nicosia is suitable for a capital; Famagusta, though very unhealthy, might be made a good harbour; Larnaka, though only an unsheltered roadstead, monopolises the trade, exporting dates, raisins, and salt—characteristic products of a dry island.
 3. Even the smaller ones, however, help to form the remarkable series of Imperial 'footholds' by which British commerce with the East is supplied with protection, coal, and telegraph facilities. Cf. p. 48.

Surface.

1. Asia is by far the largest and the highest of all the continents.

1. It is four times as large as Europe, twice as large as Africa, and larger than North and South America put together; and it

has a number of mountains 5000 or 6000 feet higher than the highest summits of the Andes.

2. The predominant feature is the extent and the height of plateau formation (cf. Africa), which divides it into four wide areas.

1. The Western Plateau stretches from the Black Sea to the Pamirs and the Sulaiman Mountains; the Eastern Plateau stretches from the Pamirs and the Himalayas to the Tchuktchi peninsula.
2. North-west of the whole plateau curve, from the Caspian to the Kolima, are the lowlands of Siberia and the Kirghiz Steppes; south-east of it, from the Indus to the Amur, are the—much more broken—lowlands of Mesopotamia, India, and China.
3. As the breaks between these southern lowlands are again more or less barren plateau, there was very little intercommunication in early times; and, therefore, the various lowland peoples developed quite independently of one another, and so made very slow progress in civilisation. And, as the general watershed is still more barren and inaccessible, the northern and the southern lowlands were still more isolated from each other.

3. The Pamirs may be considered the centre of the whole system.

1. The ranges and plateaus of the west are lower than the ranges and plateaus of the east; and the eastern ranges separate as they rise, while the western ranges draw together as they fall.
4. The system regarded as a whole, however, has three features in common throughout its entire length.

1. The face towards the northern lowlands is always steep. Thus, the Caucasus, Tian Shan, Altai, and Yablonoi Mountains form a steep continuous face to the Kirghiz and Siberian lowlands; and south of this line there is an area of relatively deep depression, the lowest parts of which are marked by the Black Sea, Kur valley, Caspian Sea, Tarim basin, Lob Nor.
2. The central ranges—Elburz, Hindu Kush, Kwen-lun—rise steeply from this area of relative depression to a great height, from which they have a short slope on to the plateaus of Asia Minor, Iran, Tibet.

3. The southern ranges—the Taurus, Zagros, Sulaiman, Himalaya Mountains—rise abruptly from the sea or the flood-plains of the southern lowlands to a still greater height, from which they also have a short slope on to the same plateaus of Asia Minor, Iran, and Tibet.

5. The Eastern Plateau alone occupies one-fifth of the whole surface of Asia, and has a monotonous uniformity of scenery and climate.

1. It may be divided into two areas by the rainless depression of Gobi, or Shamo (cf. § 4 [1] above), the northern being lower and narrower than the southern.
2. The chief characteristics of the northern area are—broad barren valleys sloping almost imperceptibly from the lowlands to the general level of the plateau, and a series of mountain ridges running from east to west.
3. The chief characteristics of the southern area are—the continuous stretch of Tibet, the highest plateau in the world, and the typical plateau-edge of the Himalayas, the highest mountains in the world.

N.B.—The parallel range of Karakoram Mountains has in Mount Dapsang (28,700 feet), a worthy rival of Mount Everest.

6. The Central Depression is only relatively low, and is really a lower terrace of the plateau.

1. It is the site of an old sea, vestiges of which are still left in the rapidly-disappearing Han-hai, or Tarim marshes, and Lob Nor; and the surrounding plateaus and the border-ridges entirely prevent moisture reaching it to replenish what is lost by evaporation.

N.B.—It was probably the beginning of this process that caused the early migration westward of the Huns and Mongols. Cf. p. 310.

7. The Western Plateau is joined to the Eastern by the Hindu-Kush and its parallel chains, and may be divided into three areas—Iran, Armenia, Asia Minor (or Anatolia).

1. The lowest part of the Iran plateau is in the basin of the rapidly-disappearing Lake Hamun, and the highest is the 20,000 feet of Mount Demavend.
2. The lowest part of the Armenian plateau is in the basin of the Caspian, which is also drying up (cf. p. 53); Mount Ararat rises to about 17,000 feet.

3. The Taurus and the Pontic Mountains are typical border-ridges of the Anatolian plateau.

8. The northern lowlands lie practically to the N.W of a line running from Merv through Tomsk to Verkhoyansk.

1. S.E. of this line the land rises rapidly to the plateau, forming dry steppe, and being famous pasture-land.
2. There is also a general slope from the N.E. down to the S.W., illustrated by the level of the various lakes, *e.g.* Lake Baikal (1550 feet), Lake Balkhash (780), Lake Aral (157), and the Caspian (85 feet *below* ocean level).
3. Of the lowlands proper, much retains its old character of a sea-bed, and is useless in most places; the extreme north is barren tundras, merging southward into marshy forest; and only Western Siberia is fertile.

N.B.—Contrast the fertile lowlands of the S.E.—India and China.

9. The structure of Asia, therefore, favours the formation of extremely long rivers, with basins of enormous area.

1. Thus, only the Mississippi, the Amazon, the Congo, and the Nile, have greater length or larger basins than the Yenisei or the Yang-tse-kiang.

10. Owing to the scarcity of rain in the interior of so huge a continent, however, and to the diversity of surface, the rivers have comparatively small volume, and most of them never reach the ocean at all. Cf. p. 246.

1. The predominant feature of the Asiatic river-system is, therefore, the enormous area of inland drainage, which covers an area much larger than Europe, and fully half the size of Africa.
2. Next in area to the inland drainage comes that of the Arctic Ocean, which includes all the northern lowland and much of the plateau. Its predominant feature is the large proportion of *eastward and westward* navigation made possible by the fact that each of the great waterways really consists of *two* rivers of almost equal importance, *e.g.* the Obi and the Irtysh, the Yenisei and the Angara. Cf. p. 267.
3. The same principle is found to some extent, with the same beneficial result, in the Pacific and Indian Ocean drainage

areas, cf. The Amur = the Argun + the Shilka, the Ganges and the Jamna, the Indus and the Sutlej, the Euphrates and the Tigris.

Climate and Productions.

1. Over such a huge continent the climate must be generally 'continental,' with great extremes of cold in the north and of heat in the south.

1. At Verkhoyansk there is a 'pole of cold,' the average temperature of January being -60° F., a degree of cold unknown even in Polar regions; Baluchistan is the centre of a great heat area, the average temperature for July being over 95° F.
2. In winter, therefore, there must be a powerfully developed area of high-pressure round Verkhoyansk which will result in outflowing winds, and which accounts for very dry N.W., N., N.E. winds over all the outlying parts of the continent. In summer, on the other hand, there must be equally low pressure over Baluchistan, resulting in an inflowing of very wet 'monsoons.' Cf. p. 8.

N.B.—The extremities of the S.E. peninsulas are near enough to the Equator to have a double rainy season, with correspondingly even temperature.

3. Both the winter and the summer winds are, of course, affected by any mountain ranges. Even the cold dry outflowing winds have to deposit the last vestige of moisture as they climb the opposing heights; and even the warm wet inflowing winds pass over the low plain of Rajputana (the Thar Desert) without having a drop of their moisture condensed, though they deposit every year fully 50,000 tons of water on every acre of the Punjab slopes *after crossing the desert*.
2. The whole continent may, therefore, be divided into seven climatic areas:—
1. The Arctic cold dry area, *i.e.* the Tundras or Frozen Desert.
2. The Siberian Continental area—an area of great extremes (except in the Kamchatkan peninsula), which increase with the increase of height towards the east and the south.
3. The Monsoon area, which in the more northerly latitudes, *e.g.* China, has a comparatively cold winter; and in which the change of monsoon is accompanied by furious storms—'cyclones' in the Indian Ocean, 'typhoons' farther eastward.

4. The intermediate area of the Central Plateau, which is excessively dry, and has great extremes, but on which the height prevents the summer ever being so depressingly hot as it is, *e.g.* in the Aral-Caspian lowlands.
5. The Mediterranean area, where latitude and the peninsular conditions give Asia Minor an exceptionally good climate.
6. The hot deserts of the southern peninsulas, which may be regarded as a continuation of the Sahara.
7. The insular climate of the islands, which varies with the latitude.

N.B.—Owing to the enormous area, the average winter temperature—except on the south and the south-west coasts—is lower, and the average summer temperature—except on the north and the north-east coasts—is higher than in the same latitudes elsewhere. For the cyclones, *cf.* pp. 203 and 342.

3. With such variety of climate, the vegetation must vary greatly ; but the uniformity of surface leads to wide dispersion of typical plants.

1. The Tundras vegetation is practically limited to the moss and lichens on which the reindeer feed, and therefore the inhabitants are only hunters and fishermen. *Cf.* p. 9.
2. The Siberian area, with its loamy soil, supports temperate forests,—evergreens, especially larch, to the north, and deciduous trees, especially birch, farther south.
3. Where extreme dryness and great changes of temperature cause the accumulation of sand and militate against the growth of large trees, there are areas of steppe—rich pasture on the borders of the forest lands, and very poor pasture on the borders of the actual deserts. Thus, the Turanian, Tarim, and Shamo steppes are very poor, while those of the upper Irtysh and the Salenga basins are very rich ; and both are occupied by pastoral nomads. *Cf.* p. 222.
4. The hot deserts of the south-west reproduce African features, both in oasis vegetation and in typical desert plants.
5. Asia Minor reproduces the typical features of South Europe, *e.g.* olives, figs, myrtles, etc., and is generally agricultural.
6. The Monsoon area has typical wet jungle and flood-plain or delta vegetation, *e.g.* rice, cotton, indigo.
7. The sago palm, coco-nut, bread-fruit, and such spices as pepper, nutmeg, and vanilla, grow in the south-eastern islands.

Cf. the distribution of the reindeer, yak, horse, camel, elephant, for transport.

4. The mineral wealth is very great, especially in gold, coal, tin, oil, and salt.

1. The gold is most abundant in the north-east, which has probably a geological connection with the Yukon region of America (cf. p. 164), in the Urals, and in India.
2. The coal is most abundant in China and the eastern islands, especially Japan, Hainan, and Sakhalin.
3. Tin is the characteristic mineral of the Malay peninsula and archipelago. Cf. p. 363.
4. The petroleum comes mainly from Caucasia, but also from Burma and Sumatra.
5. Layers of rock-salt are common, *e.g.* in India (cf. p. 333), and salt-lakes are still commoner.

ANATOLIA.

1. As the Pontic range rises abruptly from the north coast, and the Taurus range abruptly from the south coast, there cannot be many good harbours on the Black Sea or the Levant.

1. The north coast has no good harbour at all, nor even a safe roadstead except Sinope, but the exigences of trade make Trebizond and Samsun important,—Trebizond as being the most easterly roadstead in the peninsula, and Samsun as tapping the rich wheat district of Sivas.
2. On the south coast Marmarice and Makri have the best harbours, but Adalia (Attalia) and Mersina do most trade.
3. The boundary towards the Iran plateau is a vague depression running southward from Mount Ararat—where Russia, Turkey, and Persia meet—while that towards the Arabian plateau is mainly the Jihun gorge.

2. The broken, island-fringed west coast has many excellent harbours, of which the best is Smyrna.

1. Smyrna, at the head of a deep gulf which has exceptionally good communication inland *via* both the Gediz Chai

(Hermus) and the Mendere Chai (Mæander) rivers, is the natural trade-centre for the west.

2. Lemnos, Mitylene, Syme, Samos, and Rhodes have famous harbours; Chios, 'the fertile,' is noted for wine and mastic; and all the islands have a sponge fishery, which is most productive round Syme.

3. Crete, Chios, Samos, Rhodes, and Patmos have also special historic interest; but Crete has lost its old importance—as commanding the entrance of the Ægean Sea.

3. The surface is a broken plateau, sloping generally from the Erzerüm heights down to the archipelago coast, with the abrupt buttresses of the Pontic and Tauric ranges.

1. The average height of the plateau is broken on the north by the deltas of the Kizil and Yeshil Irmaks, on the south by the Pamphylian and Cilician plains, and on the west by the peak of Mount Olympus.

2. West of the Anti-Taurus range there is wide central plain, dotted with salt lakes, *e.g.* Tuzla Gol, and merging northward in the barren steppes of Angora, and westward in the railway-threaded defiles of unnavigable rivers. East of the Anti-Taurus the general level rises, and is crossed by ranges from E.N.E. to W.S.W., amongst which the Tigris and Euphrates rise; but here, too, there is a typical volcanic plain dotted with salt lakes, *e.g.* Van.

4. There are, therefore, three climatic zones, with their appropriate vegetation.

1. The north coast has damp muggy summers, and damp cold winters, and the Pontic slopes are covered with timber.
2. The plateau, shielded from damp winds both off the Black Sea and off the Levant, has a continental climate, the extremes increasing towards the east; the better watered parts produce excellent wheat, and the drier steppes are the home of the Angora goat.
3. The south and west coasts have a mild even climate, appropriate to the olive, fig, orange, 'valonia' oak, opium poppy, liquorice, etc.

5. Proximity to Europe, and the fact that it links Europe to Asia, have given Anatolia considerable political importance; and the absence of navigable

rivers and of other approaches to the plateau have concentrated its importance in a few centres.

1. Thus, Brûsa, with its famous silk factories and hot springs, commands the pass below Mount Olympus, as Manissa (Magnesia) commands the Gediz Chai valley, Aidin commands the Menderes valley, and Adana commands the 'plain of Tarsus' and the 'Cilician Gates.'
2. Angora commands the north of the great western plain, as Konia (Iconium) commands the south; Kaisariyeh (Cæsarea) commands the road below Mount Argæus to the easiest passes across the Anti-Taurus; the rocky heights of Erzerum make it an appropriate site for a great military station.

THE ARABIAN PENINSULA.

1. MESOPOTAMIA, though now a dreary land of ruined cities, still possesses the advantages of soil and climate which were used to such good effect in the days of the Chaldean and Assyrian empires; but the blight of Turkish dominion has ruined it.

1. The great plain of Upper Mesopotamia contains now only two cities—Mosul, opposite the ruins of Nineveh, and Diabekr, which commands all the trade converging on the river-cut passes between the Syrian desert and the Kurdistan mountains, and which is the head of raft (inflated sheepskins) navigation on the Tigris.
2. The lower plain, ancient Babylonia, has been transformed from 'a garden of the Lord' into a fever-breeding swamp. Baghdad has an unrivalled position for inland trade, and is the head of steam navigation; Basra is the port for ocean steamers, and exports enormous quantities of dates; Kurna commands the confluence of the two great rivers in the Shat el-Arab.

N.B.—A telegraph line from India passes up the Euphrates valley to Scutari (a suburb of Constantinople.)

2. Syria has no good harbours, but there are several roadsteads.

1. Haifa, in the lee of Mount Carmel, has the best shelter; but Beirut and Iskanderun (Alexandretta) do most trade.

3. The surface consists of a coastal plain and two parallel ranges of mountains with a remarkable 'rift-valley' between them.

1. Along the rocky northern coast the plain is very narrow, but south of Mount Carmel the plains of Sharon and Philistia are much broader; and east of Mount Carmel the plain of Esdraelon gives easy access to the Jordan valley. Cf. p. 17.
2. The mountains are high enough to have heavy falls of snow, which give unfailing supplies of water to the Jordan and the Orontes; and their terraced sides feed numerous flocks of sheep. There are Spring and Autumn—'Former and Latter'—rains.
3. The Jordan valley is the deepest depression in the world—the Dead Sea being 1300 feet below the level of the Mediterranean—and the heat is therefore so intense that the Dead Sea is excessively salt, and the river-side vegetation is tropical.

N.B.—The depression is continued in the Gulf of Akaba (cf. p. 241).

4. This land, which was once 'flowing with milk and honey,' is now practically barren, as reckless felling of the forests has deprived the soil of all protection against winter storms and torrents; but wheat is still produced on the plains, and wool on the hills. The olive and the vine are less important now, however, than oranges and tobacco (cf. Jaffa and Latakia). Cf. p. 309.
 5. Under the conditions of modern trade, the country is much impeded by its physical obstacles. For instance, a railway from Aleppo to Iskanderun must climb or tunnel the high Alma Dagħ range; one from Tripoli to Homs and Hamah must cross a rocky desert to reach the Orontes valley; the main line from Beirut to Damascus (cf. p. 10) crosses the double Lebanon range; and that from Jaffa to Jerusalem has its terminus at the highest and rockiest part of the Judæa hills—a fit place in olden days for a great capital.
4. Isolated by sea on three sides, and with no great trade route across its pathless deserts, Arabia had to turn to maritime enterprise.
1. The west coast has no harbours, and its roadsteads are made difficult by shoals and coral reefs; but Jedda (for Mecca), Yambo (for Medina), and Hodeida (for Sanaa), are busy

centres. Besides several island harbours, *e.g.* Perim, the south coast possesses in Aden the best harbour within a radius of more than 1000 miles; and the east coast has a fine harbour in Muscat, and a number of pearl-fishing stations on the islands of the shallow Persian Gulf, *e.g.* Bahrein (British).

5. Like Anatolia, Arabia is a huge plateau buttressed by precipitous mountains; and these attain their greatest height in the south-west (10,000 feet).

1. Across the central plateau, which forms a third of the country, a ridge joins the Nejd to Mecca; and this ridge is scarred by deep valleys in which water makes the desert 'blossom as the rose.' This is the home of the Arab horse, the Arab camel, the Arab donkey—all of them the most perfect specimens of their kind.
2. The mountainous districts also form a third of the whole area, and those of El Yemen and Oman have a better climate than any other part. The Yemen ravines, with their rich volcanic soil, are the home of 'Mocha' coffee—exported from Hodeida; the Hadramût valley is famous for frankincense and myrrh—exported from Makalla.

N.B.—The other third is desert, and includes a strip of desert—the Tehama—even round the coast.

3. Aden, like Gibraltar, is a peninsula connected with the mainland by a narrow sandy isthmus. The town lies in a large crater, where the heat is terrific; and the garrison have often to distil sea-water, through there are magnificent ancient reservoirs to catch the rare rainfall.

The island of Perim, the Kuria Muria islands, and Somaliland (with Sokotra, *cf.* p. 276), are politically attached to Aden, which is itself attached to Bombay.

THE IRAN PLATEAU.

1. THE water frontier of Persia is of little value, even for commerce, except the small portion which faces the Caspian.

1. The Aras, Atrek, Hari-rud, and Halmand make convenient political frontiers; Bushire and Resht are busy roadsteads, and Linga and Bandar Abbas have some trade.

2. The surface of the plateau is composed either of broad plains shut in by parallel mountain ranges, or of mountain masses honeycombed with ravines.

1. The ravines are much more fertile than the plains, and a third of the whole area is useless salt-desert.
2. The climate is very dry, with very great extremes, except in the N.W. and N.E., where the mighty Elburz range does not cut off the influence of the Caspian from the interior; and the lack of rains is a great obstacle to agriculture.

N.B.—The Caspian lowlands, *e.g.* between Astrabad and the Atrek, are even forested. Cf. p. 57.

3. Animals are, therefore, more important than agriculture, though the irrigated valleys are very fertile, producing particularly beautiful roses, and opium, tobacco, wheat, and pistachio nuts. Thus, Yezd—amidst its mulberry groves, and Ispahan—amongst its wheatfields, are famed for their woollen felts, while every town in the intervening ridge of mountains—from Kashan to Kerman—manufactures the famous Persian carpets.
4. The chief towns occupy characteristic positions. The political capital of Tehran is in the centre of a riverless plain protected by the most inaccessible part of the Elburz; the commercial capital of Tabriz commands the trade across the 'isthmus' (cf. Armenia with Palestine, p. 17); Mashad is the holy city of a great Muhammedan sect; Sarakhs is a frontier fortress at the mouth of the Hari-rud defile; Shiraz, with its roses and nightingales, was the home of the great poets Hafiz and Sadi.

3. As Afghanistan is a 'buffer state' (cf. p. 123), its frontiers have been carefully settled by treaty and more or less marked out, especially along the Russian territory near Pendjeh.

1. They are, however, almost entirely artificial except for—200 to 300 miles along the Oxus eastward from Kamiah—the death-threatening snow-blocked masses of the Hindu Kush ('Killer of Hindus')—and the Seistan marsh in which the three Iran States meet.

N.B.—The principal pass through the Hindu Kush is the Bamian, eastward of which the Kafiristan frontier behind Chitral is barely 10 miles from Russian territory.

4. Afghanistan is the barrenest and wildest part of the great Iran plateau.

1. Weaklings die young ; and those who live, bear on their persons and in their characters marks of an unceasing struggle with nature for the means of life.
2. The surface may be divided into three drainage areas—to the Oxus, the Indus, the Seistan marsh. The highest level is the water-parting between the Indus and the Seistan ; and the lowest levels are the Seistan basin S.W. of a line from Herat to New Chaman, and the Kabul valley east of Jalalabad.
3. The commercial and military routes are few, but very important ; and they are marked by the sites of world-famous cities. Two routes—from Mashad and Bokhara—converge on the fertile province watered by the Hari-rud ('River of Herat'), the valley of which is the best route from the north-west to India ; two routes—*via* Khulm and the Khaibar Pass—converge on the political capital of Kabul ; two routes—*via* the Bolan Pass and the Halmand ('The Embanked') valley—converge on Kandahar.

There are also cross routes—from Kabul to Kandahar *via* Ghazni and Argundab, and from Kandahar to Herat *via* Girishk and Farra.

5. Baluchistan is geographically an extension of Afghanistan, but politically part of India.

1. Its capital is Khelat, and it has two roadsteads in Gwadar and Sonmiani. A good deal of trade goes by the railway from Sibi, *via* Quetta or Harnai, to Chaman, for Persia.

INDIA.

Surroundings.

1. INDIA lies between an enormous area of land, and an almost equally enormous area of sea.

1. This is reflected in the climate, with its alternation of dry and wet seasons.
2. The sea area is entirely within the Tropics, and contains warm currents.

3. The land area is entirely outside the Tropics, and has a great average height.

2. The coast, though long, is not very accessible, for several reasons.

1. In many places, especially round the north and the east of the Bay of Bengal, the coast is simply swamp.

2. At the mouths of the great rivers, which would naturally give the easiest access inland, the strength of the river current and the conflict of sea and river make navigation difficult and dangerous, especially on the Hugli.

3. Between the various river-mouths the coast is monotonously regular, any possible harbours having been largely ruined by sand washed up by the sea and mud brought down by the rivers. Cf. the African coast, p. 298.

3. Bombay is the only really good harbour in the whole country, but Calcutta, Karachi, and Madras are very useful.

1. Bombay is an island harbour—large, safe, and easily accessible—opposite the southern entrance to the Suez Canal, *via* the Red Sea. It had very bad access inland until the construction of railways across the Western Ghats, and it has no local supplies of coal; but it is the natural outlet for the trade of Western India, the Deccan, and the Central Provinces, and, therefore, its chief exports are cotton, wheat, and opium. Cf. p. 331.

4. Karachi is the great wheat port of the Punjab, and also exports the products of the Western Himalayas.

1. It is far enough away from the mouth of the Indus to be safe from the constant currents and periodical floods, and the level of the Indus plain has made the construction and the working of railways and canals easy and cheap. As the nearest point to Quetta and New Chaman, it has also considerable political and military importance.

5. Calcutta is one of the most dangerous and expensive harbours in the world.

1. Both the danger and the expense come from the terrific force of the river-currents, especially during the summer rains; and, when this fierce downward current meets a spring tide

going up the river, the result is a 'bore' of the most dangerous description, travelling for 100 miles up stream at the rate of 18 miles an hour, and a height of 5 to 10 feet.

2. As the natural outlet for the immense agricultural wealth of the Bengal alluvial plain, however, it has so much importance that it is worthy of its position as the capital of the Indian Empire; and it has the great advantage of being near the best coal-mines in India—at Raniganj, in the Damodar valley.
3. As the N.E. corner of Hindustan consists partly of deep alluvial plain and partly of high forest-clad mountains, with great heat and very heavy rains, the special exports from Calcutta are opium, rice, jute, tea, and indigo. Cf. p. 331.

N.B.—It is the last of a dozen harbours which have stood on the Ganges-Brahmaputra delta, and all of which have been ruined by the river. The only other still remaining is Dacca.

6. Madras stands on a surf-beaten coast, without either a navigable river or necessary shelter.

1. Its special trade is in teak from the Western Ghats, sugar from the Coromandel coast, and such products of Mysore as go eastward. Cf. p. 334.

7. The land boundaries offer practically insurmountable obstacles to invasion and commerce, except in the north-west.

1. The Himalaya Mountains run along the north for 1500 miles, with an average height of 17,000 feet, and an average width of 150 miles; at least 100 peaks are at least *four miles high*, and there are miles upon miles of glacier.
2. The north-east portion is defended by spurs from the Himalayas, overhanging a dense and deadly wet jungle.
3. The north-west is accessible by two or three deep defiles across the Sulaiman Mountains, especially the Khaibar and the Bolan Passes. Cf. p. 324.

Surface and Climate.

1. Like the continent of Africa, India consists of a low oblong plain in the north, and a high triangular plateau in the south.

1. The Tropic of Cancer divides the two areas in India very much as the equator divides them in Africa.
2. As in Africa, the shape of the country makes the northern half larger than the southern.
3. As in Africa, too, the northern half is an oblong running east and west, and the southern half is a triangle running north and south.
4. As in Africa, again, the northern or continental half is lower, drier, and hotter than the southern or peninsular half.
5. The northern area includes politically, but not geographically the dry, dreary plateau of Baluchistan on the west, and the rich river-valley of Burma on the east.

2. The Indo-Gangetic basin is one enormous plain—Hindustan—shut in by mountains everywhere except in the S.W. and S.E.

1. The mountains in the north, being of gigantic size, supply the water for the magnificent rivers of Northern India, on which the very existence of Indian commerce and agriculture depends.
2. The 'mountains' which separate the estuaries of the Indus and the Ganges include the Vindhya range, but are really the high northern edge of the peninsular plateau.
3. The pace and volume of the rivers, and the height from which they fall, cause them to carry down an immense amount of alluvium, which is invaluable for agriculture; and the low level of the plain offers every facility for irrigation and communication.

3. The peninsula of the Deccan is practically a continuous plateau shut in by mountains.

1. On the west the Ghats are high, steep, and very near the sea; and, therefore, they are a formidable condensing medium to wet winds from the S.W., and a formidable obstacle to commerce.
2. The Eastern Ghats, being low and discontinuous, present little obstacle to winds or commerce.
3. As the double northern range—the Vindhyas and Satpuras—run east and west, they present little obstacle to the S.W. winds; and the valleys of the Nerbada and the Tapti, and the Khandwa depression across the Satpuras, greatly facilitate communication.

N.B.—The *Great Indian Peninsular Railway* (G.I.P.) follows the Khandwa route, Khandwa being a junction for Allahabad, Benares, Delhi, etc.

4. The Nilgiri Hills, in which the two Ghat ranges meet, are nearly 9000 feet high, *i.e.* twice as high as Ben Nevis ; and thus they have become one of the most important sanatoria in India. Fortunately, just south of them there is a very curious defile, the Gap of Coimbatore, which separates them from the still higher Cardamum Mountains, and which gives easy communication, *e.g.* between Calicut and Trichinopoly or Madras.

4. The three great rivers of Hindustan all start near together in a lake district on the north of the Himalayas, and supply the soil, the manure, the moisture, the drains, and the highways of carriage, for all the wealth of the Indo-Gangetic plain.

1. The Indus is usually navigable for small vessels for 900 miles —up to Attock ('Limit'), but it brings down so much mud that it is often choked up ; and, therefore, its great and permanent value is for irrigation. With its four chief tributaries, it has made the Punjab ('Land of Five Rivers') one of the wheat granaries of the world.

N.B.—The absence of large towns along the Indus is significant of the character of the river. Contrast the Ganges, p. 4.

2. The Ganges, though nominally the main stream, starts on the south of the Himalayas, and is inferior in length and volume to its Ghogra 'tributary,' which starts on the north. (Cf. the Mississippi and the Missouri, the Danube and the Inn.) The Ghogra supplies the volume and the mud, while the Ganges is the more useful for navigation, especially as far as Cawnpur ; in fact, the whole course of 1200 miles from Hardwar, where the river drops on to the plain, to the ocean is of more or less value for navigation.

N.B.—The distance from Allahabad to the source of the Ganges is less even than that to the source of the Jamna.

3. The Brahmaputra has the greatest volume and pace of all the Indian rivers. Indeed, its force is quite uncontrollable, so that in the meantime it is less useful than the Ganges and the Indus.

N.B.—The upper course of the river, 1000 miles in length, under the name Sanpu, is not in India at all.

5. The cross ranges on the northern edge of the plateau receive enough rain to give birth to three considerable rivers in the Narbada, Tapti, and Mahanadi.

1. All these are invaluable to agriculture ; their valleys offer natural routes for railways, the direct route from Bombay to Calcutta running for miles along the Tapti ; the valleys of the Narbada and the Tapti have a distinct effect on the climate (cf. p. 327) ; and the Narbada, like the Ganges, is a sacred stream.

6. The principal rivers of the plateau itself are the Godaveri, Krishna (or Kistna), and Kavari (or Cauvery).

1. The Godaveri, the largest of them, is more than four times the length of the Thames, and about the same length as the Indus. They are all more or less useless for navigation, but invaluable for irrigation ; and they all form deltas of inexhaustible fertility.

7. The Irawadi is becoming one of the great commercial highways of the world.

1. It is navigable almost up to the Chinese frontier, Bhamo being the head of navigation, and practically attracts the whole population of Burma to its banks, especially along the 400 miles between Rangoon and Mandalay. Cf. p. 4.

8. As India stretches for nearly 2000 miles from north to south, and varies in height from a few feet below to five and a half miles above sea-level, the climate also varies greatly.

1. This variation depends much more on longitude and elevation than on latitude ; the average temperature of Hindustan is actually higher than that of the Deccan, and the difference between the Thar Desert and Bengal is greater than that between the plain and the plateau.

9. The regulating factor is the distribution of the Monsoons.

1. From May to September (more or less inclusive), the up-draught from the heated continent draws the S.E. 'Trades' across the 'equator right up to the Himalayas, the rotation of the earth deflecting them, north of the equator, so that they reach India as S.W. Monsoon winds.
2. During the 'northern' winter the N.E. Trades blow regularly from the Tropics to the Equator, and are called the N.E. 'Monsoons.' They are naturally dry winds, but towards the east they gather sufficient moisture off the Bay of Bengal

to deposit a fairly heavy rainfall on the low Eastern Ghats. Cf. the N.E. of Ceylon.

3. As the S.W. winds come over hundreds of miles of tropical sea, they arrive saturated; and, as they naturally deposit their burden towards the N.E., the heaviest rains are on the Western Ghats and on the Khasi Hills. On the latter, Cherra-Punji has recorded an annual rainfall of more than 22 yards.

N.B.—This S.W. Monsoon is deflected up the Ganges valley as a S.E. wind by the great wall of the Himalayas.

4. The whole Indo-Gangetic basin may, therefore, be divided into five areas—dry hills and dry plains in the N.W., damp hills and damp plains in the N.E., and a medium climate with a medium elevation on the water-parting of the Delhi ridge. Cf. § 1 (1) below.
5. As the Deccan is entirely within the Tropics, the sun heat is always great, though modified by the height, and the length of the day varies very little. In the south the difference of time between the longest and the shortest days is only one hour, and the difference of temperature between the hottest and the coldest is only 5° or 6°.
6. Where the level is so low that there is absolutely no condensing medium, as in Sindh, or where mountains entirely anticipate the wet winds, as in Mysore, there are areas of desert and semi-desert. Cf. The Thar.

Productions.

1. THE vegetation, both indigenous and imported, varies with the climate.

1. For instance, dry hills produce wool, and dry plains produce wheat; damp hills produce tea, and damp plains produce rice.
2. In a country with such a large area of alluvial plain, with sufficient heat and moisture, the vegetation is almost sure to be more important than the mineral wealth.
3. Motives of economy, the climate, and religious scruples cause the vast majority of the people of India to live mainly on vegetable food.

2. The vegetable wealth is divided between agricultural, pastoral, and forest products.

1. The agricultural products include grain and fibre.
2. The pasture supplies, especially, horned cattle and wool.
3. The forests produce food, shelter, clothing,—timber for commerce and for domestic use.
3. The chief grains are rice, millet, and wheat ; the chief fibres are cotton, jute, and tobacco.

1. Rice and millet form—with various kinds of fruit—the staple food of the natives. Both are nutritious and prolific, but rice requires the more moisture ; consequently, rice grows on all the deltas and low coast-strips, especially round the Bay of Bengal, while millet grows inland, especially in the province of Madras.

N.B.—Burma produces rice to the value of some £6,000,000 a year.

2. Wheat flourishes on the low dry plains of the Punjab and on the high dry tableland of the Central Provinces.
3. Cotton has the same climatic connection with rice as wool has with wheat ; and so it flourishes in the Ganges valley and on the sticky 'black-soil' lands of Bombay, especially on the plains of Khandesh, North Berar, and Wardha—where the soil is a fertile decomposition of volcanic rock and the S.W. Monsoons have access *via* the Tapti valley.
4. Jute grows better on the sand-banks of the Bengal rivers than anywhere else in the world, especially between Goalpara and Purniah, where the Brahmaputra more than repairs the ravages caused by such an exhausting crop.
5. The tobacco is grown mainly on the low lands along the Kavari, the Sabarmati, and the Irawadi, especially round Trichinopoly and Kaira.

4. Amongst the other agricultural products, the most important are 'oil' plants, tea and opium,—coffee, cinchona, and indigo being next in importance.

1. The oil plants are somewhat a subsidiary crop to rice, and are in demand locally for food, outward application, and lighting purposes.
2. The tea requires iron and vegetable refuse in the soil, heat and moisture, and a slope steep enough to prevent the moisture from settling round the roots of the plant. Assam provides the best site for the lowland variety, especially round Silchar, Sibsagar, and Dibrugarh ; and the Darjiling and Kangra valleys are the best for the highland variety.

3. The opium, like the tea and tobacco, has a political importance, because it gives local employment to a considerable number of workmen, and because it is a source of large revenue to the Government. The chief centres are Patna and Ghazipur.
4. The coffee comes mainly from the Ghat valleys of Coorg and Mysore, where the water supply is plentiful, the heat great, and the accumulation of vegetable refuse enormous.
5. The indigo, which also employs local labour, is grown mainly in Bengal, Behar, and Madras; and the cinchona is planted largely to protect the seedlings in the Himalayan tea gardens, though very valuable in itself for its 'Peruvian bark.'

5. Pasture must be limited in a densely-peopled country like India, except where the rainfall is insufficient and there are no facilities for irrigation.

1. As milk is very important to an almost vegetarian population, cows are kept everywhere; but the special demand for horned cattle for transport and field labour is supplied largely from the semi-desert land between the Luni river and the Aravalli Hills.
2. The dry hills of the N.W. feed sheep and goats, which are kept mainly for their wool; most of the beautiful Kashmir 'wool' is 'mohair,' *i.e.* from goats.
3. The damp forested hills of the N.E. and the Malabar coast still harbour the elephant; the sandy desert of Sindh requires the camel; and the salt plains of Rajputana are famous for their wild asses. Cf. p. 322.

6. The forest products include teak, sal, and deodar; bamboo, mango, and palm.

1. The teak comes from the wet jungles of Bombay, Assam, and Burma; the sal is characteristic of the drier climate of Central Hindostan; and the deodar and other cedars are sub-tropical trees, growing on the slopes of the Himalayas. Cf. the great furniture industry of Bareilly.
2. The bamboo and mango are two of the most useful products of India, the latter providing food (between the grain harvests) to thousands of peasants, and the former providing almost every possible kind of utensil and furniture.
3. The most useful palm is the coco-nut, which grows along the shores in the Tropics, and supplies fibre for mats and ropes. The date palm also is found—along with sandal-

wood—on the dry hot plains of the Deccan, especially in Mysore.

7. The minerals, though much less important than the vegetation, are valuable, and include coal, salt, oil, tin, gold, and precious stones.

1. The coal is found in the Damodar and Narbada valleys, and in the hills of Chutia Nagpur, where it is very useful for the two railway routes from Bombay to Calcutta. There is also some in the Godaveri valley, near the main line from Bombay to Madras ; and a few small fields—of excellent quality—have been found in the N.E. of Assam.
2. The salt is dug from the 'Salt Range' in the N.W. of the Punjab, especially at Kohat, and evaporated along the coasts and from the brine lakes of Rajputana.
3. The petroleum is found chiefly in Burma and Upper Assam ; and there are rich deposits of tin—the characteristic metal of the Malay Peninsula (cf. Queensland and Tasmania)—in the Tenasserim district of Burma.
4. The gold is found mainly in Mysore, and the bulk of the precious stones in the Deccan and Burma (rubies).

Towns.

1. As the natural resources were not such as to attract the inhabitants into large industrial centres, the sites of the old towns were chosen for political and other reasons.

1. These include easy defence, facilities for obtaining food, superstition, natural wealth in salt or flint or clay, and trade. Cf. p. 10.
2. Calcutta contains about 1,120,000 (with Howrah, nearly 1,300,000), and Bombay about 770,000 inhabitants.
1. Calcutta is essentially mercantile, though there are important jute and paper industries. It is the largest city in the British Empire except London. Like most Indian cities, it has a White and a Black part. It was the creation of the British 'adventurers'—where the gigantic agricultural wealth of Bengal must converge to leave the country.

2. Bombay is also a British creation. It is really a more important commercial centre than Calcutta, and has also great industries, especially cotton. Cf. p. 325.

3. Madras has rather more than 500,000, and Haidrabad has rather less than 450,000 inhabitants.

1. Madras was also of British creation, but is hopelessly lacking in the requirements for a great mercantile or industrial centre. It is, therefore, relatively a literary and professional centre.

2. Haidrabad, the capital of the principal Deccan state, was founded on a small plain, watered by a fair-sized river, within easy reach of the Golconda diamond mines, and surrounded by a ring of defensive hills.

4. There are six cities of 'third rank,' *i.e.* with populations of 300,000 down to 200,000.

1. Lucknow (264,000) owed its site to the caprice of a local chief, and the industrial arts fostered by an Oriental court still linger. Its position has made it in modern times a natural railway junction, and its history in connection with the Mutiny made it an important military centre. Its commercial value would be greater if the Gumti were not so deserving of its name, 'The Winding One'; but the land round is so fertile that it has been called 'The Garden of India.'

2. Rangoon (230,000) owed its old importance to its sacred site, and now commands the mouth of the great Irawadi.

3. Delhi (210,000), from its position on the Indo-Gangetic water-parting, enjoys the arable advantages of the Ganges basin and the pastoral advantages of the Indus basin, and commands the through trade between the two. The scene of some most stirring incidents during the Mutiny, it stands on the ruins of ten cities!

4. Benares (210,000), the oldest city in India, owes its importance mainly to historical associations. It is considered very sacred by the Hindus, and its riverside 'Ghats' or stairs are haunted by 'holy' men of unique filthiness and deformity. It is very convenient to the sacred Ganges, and is a railway junction.

5. Lahore (200,000) is the natural capital of the Punjab, the junction of four important railways—to Peshawar, Bombay, Calcutta, and Karachi (*via* Multan).

6. Cawnpur (200,000), the scene of Nana Sahib's foul treachery, is a natural rail and river junction, which has attracted a large leather, wheat, and cotton trade.

5. There are seven cities of 'fourth rank'—over 150,000.

1. Agra, an old Moghal capital, is a through-trade centre between Delhi and the Deccan, commanding the sudden bend in the Jamna.
2. Ahmadabad, an old Musalman capital on the fertile Gujarat plain, owes its present importance to the growing and weaving of cotton, and to its position where the Bombay and Baroda railway crosses the Sabarmati river.
3. Mandalay owes its importance to the fact that, as Burma is very long compared with its width, all traffic and population converge on the great waterway (cf. Egypt and the Nile).
4. Allahabad, at the confluence of the two sacred rivers of Hindustan, was a great pilgrim centre; and, as the terminus of the chief—and, till lately, the only—trunk line from the Ganges plain to the Deccan, it still attracts pilgrims. After the Mutiny it became the seat of the Provincial Government.
5. Amritsar, the sacred headquarters of the Sikhs, commands the Kangra tea trade and the Kashmir wool trade (manufacturing shawls of the wool), and collects the wheat of its fertile surrounding plain.
6. Jaipur, a Rajput capital, has rail connection with the salt works of L. Sambhar, and supplied the white marble and red sandstone for the splendid buildings of Delhi and Agra.
7. Bangalore, on one of the highest parts of the Deccan plateau, has a fine climate; and, as a natural railway-junction between Bombay, Madras, and Mysore, it has attracted a large population, especially of Europeans.

6. There are about a dozen cities of 'fifth rank,' of which the following are the most important.

1. Poona (150,000) stands, at a height of more than 10,000 feet, at the eastern, *i.e.* the dry, end of the Bhor-Ghat pass across the W. Ghats. An old Maratha capital, it is still the headquarters of the Bombay Government during the rains.
2. Patna (135,000), the centre of the opium trade, has easy access by rail to the Himalayan sanatoria, the Nipal forests, and the saltpetre deposits of Behar.

3. Nagpur (125,000), another Maratha centre, is on the direct line from Bombay to Calcutta, and has a branch line through the splendid cottons lands of the Wardha valley.
4. Srinagar (125,000), on the alluvial plain of the Vale of Kashmir, with 60 miles of navigation on the Jehlam, is the centre of all the Kashmir trade, especially in wool and Tasar silk (from the jungles).
5. Baroda was more important when it controlled the trade between the coast and the interior, as Surat was before up-river harbours were displaced by ocean ports.
6. Gwalior is a typical old Rajput rock-fortress, as Karachi is a typical new British grain port (cf. p. 325).

N.B.—The other towns are Bareilly (p. 332), Meerut, Madura, and Trichinopoly (p. 331).

7. Among the smaller towns, several have considerable military, historic, or industrial interest.

1. Simla, Darjiling, and Utakamand are summer stations.
2. Peshawar (95,000), Rawal-Pindi, Quetta, and Ambala are military stations.
3. Chittagong, Maulmain, and Negapatam are rising ports.
4. Tanjore, Bellary, Raipur, and Shikarpur are commercial centres, the latter collecting goods on the edge of the semi-desert tract for transmission to Kabul and Herat.
5. Sakkar stands where the Indus can be bridged; Cuttack commands the railway crossing the Mahanadi just above the delta; Rurki is the headquarters of the Ganges canal system.
6. Calicut is the oldest port in India, and gave its name originally to *calico*; the names of Arcot and Plassey are forever bound up with the famous story of the Conquest of India, as that of Meerut is with the outbreak of the Mutiny.
7. Portugal owns the territories of Goa, Damao, and Diu; and France has five *dépendances*, of which the chief towns are respectively Pondicherri, Chandernagore, Karikal, Mahé, and Yanaon.

'INDIAN' ISLANDS.

1. CEYLON, which is nearly as large as Scotland, reproduces closely the climatic and vegetable conditions of the south of the Deccan.

1. As an island, its temperature is rather more even, and its rainfall more certain; but the dominating factor is still the Monsoons, and the eastern side is still much drier than the west. The alternation of sunshine and rain is so regular as to give rise to the proverb—"If you stick an iron bar into a macadamised road, it will blossom like Aaron's rod!"
2. The island of Rameswaram, and a series of coral reefs called Adam's Bridge, make an almost continuous division between the Gulf of Manar and Palk Strait; the warm shallow waters of the Gulf contain the valuable pearl-oyster, and their shores are covered with coco-palms. Cf. p. 322.

N.B.—As there is no channel deep enough for steamers, the surveys have been made for a railway across Adam's Bridge.

3. The whole island slopes up to the central mass of Adam's Peak (more than twice the height of Snowdon); and the gradient, the deep forest refuse, the heavy rain, and the iron-impregnated soil, make it an ideal site for the tea plant. And, as usual, the cinchona accompanies the tea.
4. The island contains very rich plumbago (graphite) mines; the river gravel is rich in rubies and sapphires; and the forests are said to be fragrant with nutmeg and cinnamon.
5. Colombo, a magnificent artificial harbour, is the most central port of the Indian Ocean—"the Clapham Junction of the Eastern Seas"; it controls almost the whole export trade of the island, and has attracted a population of 150,000—some of them from the old export centre of Galle.
6. Trincomali—where the Mahavillaganga empties after its 150 miles' run from the Horton Plains below Adam's Peak—is a finer natural harbour than Colombo; but its inaccessible situation leaves it without trade or population.
7. The old capital of Kandy is a little highland town, with beautiful scenery, a superb climate, and one of the finest Botanic Gardens (at Peradenia) in the world.

2. Among the smaller islands in the Indian Ocean, the most important belong to Britain.

1. The Andamans are used mainly as a convict settlement, though Port Blair is one of the finest harbours of Asia; and the Nicobars, which are part of the same submarine plateau as the Andamans, export coco-nuts, edible-nests, sea-slugs, and tortoise-shell (really 'turtle-shell').
2. The Laccadivs, Maldivs, and Chagos islands are groups of coral formation. They export coir; and Diego Garcia, a large atoll in the Chagos group, is an important coaling-station. Christmas island, a similar atoll south of Java, exports phosphate of lime; and the neighbouring Keeling or Cocos islands export coco-nuts.

INDO-CHINA.

1. AS a 'Buffer State' between British and French dominions, Siam has been carefully delimited, and the Franco-Siamese frontier between Bassak and Yeng Sang has been definitely fixed at the Me Kong river.

1. The native name of the country is Muang Tai—"The Kingdom of the Free."
2. It is a land of parallel mountain ranges running from north to south, drained by the Me Nam and Me Kong river systems.
 1. The Me Nam system has much the wider and richer basin, the hills being covered with teak and the plains with rice, while the villages are surrounded by bamboos, areca-palms, and coco-palms; and the western ranges are rich in tin.
 2. The damp heat and the thick jungle make the climate very deadly, even to the Chinese miners in the gold districts of Kabin and Watana on the Korat plateau.
 3. Bangkok, the capital, is the only sea-port, and cannot give access to large vessels; Ayuthia is a river port, collecting rice, teak, bamboos, and rattans for export *via* Bangkok, but the latter has already a 'river-side' railway to Paknampo (*en route* for Chiangmai), and the French railway from Vinh is tapping the Me Kong valley.

3. The Malay Peninsula reproduces the characteristic features, vegetation, and minerals of Southern Burma, with increased heat and moisture.

1. As in Burma, the low coast-lands produce quantities of rice, the river valleys produce bamboos and all kinds of hard timber, and the mountains (which are 8000 feet high) yield about half of the total supply of tin in the whole world.
2. The peninsula also produces palms along both shores, especially the coco-nut; rubber and rattans from the jungle; gambier, pepper, and tapioca from the plantations; and various kinds of spice.
3. Penang ('betel-nut') ousted Malacca as the chief centre of trade, thanks to the good harbourage between the island and the mainland of Wellesley; but it has now itself been ousted by Singapore.
4. The Protected Native States,—Perak, Selangor, Sungei Ujong, Negri Sembilan, Pahang, and Johor,—form an area nearly as large as Scotland. They all produce tin, especially Perak (in the Larut and Kinta districts); and their products include rubber, rattans, camphor, sago, and pepper.
5. Singapore has a magnificent and absolutely free harbour on the enormously important waterway of the Malacca Strait. As the island is very low, and has a very hot, damp climate, it is remarkably unhealthy, but can produce such plants as pine-apple, gambier, and pepper.

4. French Indo-China consists of three areas—Tongking, Annam, and Cambodia-Cochin-China.

1. Tongking is a forested highland encircling the pirate haunted delta of the Red River and the Thai Binh; Hanoi is the capital, and Haiphong is the chief harbour—exporting teak, rice, and coal. Hanoi is a very important railway centre.
2. Annam is a high mountain chain, which cuts off communication with the Me Kong—*i.e.* with the Lao, Boloven, and Attopeu plateaus—except by a few passes, that of Ailao between Quang-tri and Sebang-hien being the most important. Tourane, the best harbour, is near valuable deposits of coal, and exports teak, spices, tea and coffee.
3. Cochin-China and Cambodia are the delta of the Me Kong—one of the largest deltas in Asia; and, though the great Tonlé Sap Lake helps to moderate the floods, the

inundations are so regular that the rice-crop is enormous. Saigon (with Cholon) monopolises the external trade, and Pnom-Penh the internal.

4. The Me Kong struggles through the limestone defiles of Yunnan on to the sandstone Lao plateau, and then drops to practically the delta level; and as at each geological division there is a considerable fall, the river has been of much less use than its length (2500 miles) and volume would suggest. Small gun-boats can, however, pass over all the rapids up to Luang Prabang.
5. In the great lake and all along the China Sea coast there is a busy fishing industry, *e.g.* off the old Annam stronghold or Hué, connected by rail with Tourane.

CHINA.

1. IN spite of its huge size and great diversity of surface, China Proper has fairly definite natural boundaries.

1. On the north, the boundary runs along a continuation of the Nan Shan mountains and over thinly peopled steppes, which separate it naturally from its dependencies of Mongolia and Manchuria.

N.B.—Part of the frontier is still marked by the Great Wall.

2. On the west, the buttress of another dependency, the Tibet plateau, is even more distinct.
3. On the south, it is practically bounded by the ranges which form the watershed between the Si-kiang or Canton river and the Song-koi or Red River, though part of Yunnan also drains into the Salwen and the Me Kong.

2. The surface is divided into two nearly equal areas by the Yang-tse-kiang or Blue River.

1. The southern area consists of an intricate system of low mountains, running generally east and west, with its greatest height in the Yunnan plateau and its lowest level in the Hunan lake district. The main ridge—the Nanling or Southern mountains—separates the Yang-tse basin from that of the Si-Kiang.
2. The northern area may be subdivided into plain and mountains. The plain includes the entire lower basins of

the two great rivers—from the Po-yang Lake to the part of the Great Wall due north of Peking; the mountainous region is all along and west of the grand southward reach of the Hwangho or Yellow River, and its main ridge—the Peling or Northern mountains—are a continuation of the Kwen Lun, separating the 'Yellow' from the 'Blue' basin.

3. Some characteristics of these various areas are very important. Thus, much of the plain is so low, and the riverbeds have been raised so much by silt, that floods are very common and terribly destructive; the deep valleys of the N.W. are covered with loess—intensely fertile yellow dust blown from the desert by the 'Yellow' wind in winter; the Peling mountains are an almost complete obstacle to communication between the fertile Wei and the Han valleys.

3. The determining factor in the climate is the position of the country in the North temperate zone on the east of the largest land-mass in the world.

1. The temperature is one of extremes, increasing towards the north and decreasing towards the sea; and the winter cold is accentuated by the dry N.W. 'Yellow' winds. Cf. p. 316.
2. The humidity depends on the S.E. monsoons which blow inland all through the summer off the warm China Sea, slightly moderating the heat and guaranteeing that combination of warmth and moisture which offers such rewards to agriculture.
3. The alternation of dry and wet seasons has some important results. The dry cold winters maintain the health and energy of the people, and their 'Yellow' winds provide a soil—the loess—out of which none of the fertilising elements have been washed by rain; the warm damp summers offer every possible inducement to agriculture—except a uniform volume in the rivers—and enable some crops to be grown which are generally confined to the Tropics, *e.g.* rice and sugar-cane.
4. The variation in volume, of course, affects the usefulness of the rivers, even if there were no floods. For instance, at Ichang, the head of navigation for large steamers, there is a regular yearly variation of *at least 40 feet* in the level of the Yang-tse; and at Chung-King, the head of navigation for medium-sized steamers, there is a similar variation.

On the Hwangho—'China's Sorrow'—the variation is equally great and much more destructive. Again and again

its course south of Kaifeng has been changed—with most deadly effect. In 1852 a single flood moved its estuary 300 miles—from within 100 miles of the Yang-tse to its present embouchure into the Pechili Gulf; in 1887 its banks were burst again at the same place by a gigantic flood which drowned *at least one million* persons!

5. The change of monsoons has another disastrous effect in the typhoons, which always move westward and poleward from the centre of damp, hot, calm air that gives them birth; and which, therefore, making navigation off the S.E. coast of China exceptionally dangerous.

4. The chief occupations in China are agriculture and fishing, but there are manufactures and a little mining.

1. The agricultural products include rice and sugar-cane from the hot low swamps, wheat on the drier low land, tea on the warm damp hills, and opium and bamboos or oranges and cotton (with beans and mulberries) everywhere.
2. The fisheries are exceedingly important, both inland and along the coast. It is said that *40,000,000* Chinamen make their living by fishing—with every kind of line and net, by day and by night, and with every imaginable device and decoy, animate and inanimate.
3. China is remarkably rich in minerals, especially coal. The largest known coal-field in the world is in the S.E. of Shansi, and it is of exceptionally good quality. There is another large field, of inferior quality, in the W. of Shansi, and there are valuable deposits in hills west and east of Peking, in the west of the Shantung peninsula, and in the south of Hunan, the last having very easy access to the Yang-tse *via* the Siang. Shansi is also very rich in fine iron, limestone, and potter's-clay.
4. Silk has been manufactured for thousands of years, and still is the most important product of the country; but cotton and rhea are manufactured, especially round Shanghai, and porcelain—another old industry—is very important. Bean-cake and straw-plait are also characteristic products.
5. Agriculture, mining, and manufactures would all be greatly improved with better means of transport. The one great natural waterway is the Yang-tse, and the Imperial Canal—from Hangchow to Tientsin—is very important; but almost all the rivers are actually dangerous like Hwangho, or are

so impeded by rapids that the cost of transport is greatly increased, *e.g.* the Han and the Siang-kiang.

Railways are at last making way, especially in the north-east—*e.g.* from Peking to Hankow, and from Taku to Tientsin, Peking, and the Kaiping collieries. In many parts, however, they are still practically unknown, and even cart-roads are rare, especially in the south.

Towns.

1. Three towns—Peking, Siangtan, and Si-ngan—have certainly over 1,000,000 inhabitants, Peking perhaps having 1,600,000.

1. Peking was the capital of a kingdom as early as 1100 B.C. It stands on a dreary sandy plain, exposed in winter to cold dust-laden winds; but it has a good strategical position, as it commands the Nankow Pass into Mongolia *via* Kalgan or Changkiakou, the route through the Kupei-kou Gate in the Great Wall to Chengte or Jehol, and into Manchuria *via* Shanhaikwan ('Mountain-sea-gate')—a most appropriate name for a narrow pass between precipitous cliffs and the Lian-tung gulf.
2. Siangtan is the centre of a great drug-growing region—a guarantee of prosperity amongst the Chinese, who are particularly fond of taking medicine.
3. Si-ngan commands one of the very few really good routes from east to west across Northern China.

2. Three towns—Canton, Hankow, and Tientsin—have certainly between 750,000 and 1,000,000 inhabitants. And Chengtu is probably as large as Tientsin.

1. Canton stands at the west of a line of hills, commanding all the trade of the densely-peopled Kwan-tung province, with navigation for ocean vessels up the Canton or 'Pearl' river to the heart of the city, and for river steamers up the Si-kiang or 'west' river, up the Tung-kiang, or 'east' river, and up the Peiho, or 'north' river. In olden times it was also the only Treaty Port, and is still the chief silk port. (Cf. Kwang-si mulberries.)

N.B.—About 300,000 of its inhabitants live in boats.

2. Hankow, with Hanyang and Wuchang, commands one of the greatest waterway junctions in China—where the confluence of the Han beneath the hills which form the Hwangho-Yangtse water-parting, helps to cause the great S.E. sweep on the Yangtse. It is the chief tea port.
3. Tientsin is the harbour of Peking, a Treaty Port, and the northern terminus of the Imperial Canal, with rail and river communication to Taku.
4. Chengtu is a beautiful town on a fertile plain, in the healthy highland known as the Red Basin—from its rich red soil—where numerous tributaries converge on the Yang-tse, making irrigation so easy that it has been in use for 2000 years.

3. Three other towns—Shanghai, Fuchou, and Chungking—have certainly well over 500,000.

1. Shanghai is the busiest of all the Treaty Ports, being the great entrepôt for all Northern China. This is due to the fact that, although it is not on the Yang-tse but on the Wusung, it is the outlet for the whole Yang-tse valley. Its commanding position has also made it the chief arsenal of the country, and it is a busy silk-market.

N.B.—The low muddy shores of the Yang-tse estuary afford no site for a great port.

2. Fuchou, a Treaty Port at the mouth of the Min, is the centre of all the coastal trade, especially in black tea. (Cf. Fokien tea-gardens.)
3. Chungking is a Treaty Port at the confluence of the Kialing with the Yang-tse, which is also where the Sechwan highlands abut on the Yang-tse lowlands.

4. Suchou, Lanchou, Hangchou, Nanking, Ningpo, Wuchang, and Changsha have between 250,000 and 500,000, Suchou probably being the largest.

1. The canal port of Suchou is one of the chief silk-markets; Hangchou is a great centre of silk-manufacturing; Lanchou is a large tobacco centre on the chief N.W. trade-route along the upper Hwangho; and Wuchang is an important vice-regal capital, with large cotton mills.
2. Nanking commands the last defile through which the Yang-tse flows; the strategical position on the edge of the hills made it once the capital of China, and the commercial position on the river in the middle of a great silk district

made it once the largest city in the world. It gave its name long ago to *Nankeen* (cotton).

3. Ningpo is a Treaty Port for the great silk district of Che-Kiang. It was also the headquarters of the British fleet in the war caused by the introduction of Indian opium into China; since then it has become the centre of Protestant missions.
4. Changsha owes its importance to its command of the richest lowlands of the Tunting basin, and of the Siang-valley route from the Yang-tse to Canton.

5. Amongst the smaller Treaty Ports are Chinkiang, Amoy, Shasi, Chifu, and Wuchou.

1. Chinkiang is the most important river and canal junction in the whole country, and occupies the lowest place on the Yang-tse which is at all appropriate for a great harbour.
2. Amoy, a Treaty Port in the rich tea-growing province of Fokien, has the best natural harbour in China, commanding traffic with the fertile island of Formosa, and with good coal at Kelung.
3. Shasi is the chief cotton market in Central China.
4. Chifu is a Treaty Port commanding the southern entrance to the Pechili Gulf, as Port Arthur commands the northern.

N.B.—For the political and strategic importance of this position, cf. the British naval station of Weihaiwei and the German Kiau-chou.

5. Wuchou is the head of navigation for river steamers on the Si-kiang, and the outlet of the long river-plain of Kwang-si.

6. Of the less important towns, probably Taiyuen, Kaifeng, and Tsinan have the largest population.

1. Taiyuen commands the central and widest valley of a series of parallel valleys running from N. to S. in Shansi ('West Mountains').
2. Kaifeng, the capital of Honan, where delta and valley meet, overlooks the scene of the most destructive floods (cf. p. 342).
3. Tsinan commands the rich, densely-peopled slopes from the Hwangho delta-plain to the highlands of the Shantung peninsula.

THE CHINESE EMPIRE.

1. **MANCHURIA** is a grassy plain shut in by the Chingan and Shan Alin or 'Long White (-limestone) Mountains,' with convenient political boundaries in the Amur and the Usuri.

1. Mukden, the capital of the Shengking province, commands the 'neck of approach' up the Liau valley from China, and has a so-called Treaty *Port* in the inland town of Niuchwang, the real 'port' being at Yinkau.
2. Tsitsihar, the capital of the Helungkiang province, is at the head of navigation on the Nonni; and, as long as the Amur is unfrozen (June to November) there is excellent navigation to Aigun.
3. Girin—often misspelt *Kirin*—the capital of the whole country and of the Girin province, is at the head of navigation on the Sungari; and the parallel Usuri valley commands the railway to Vladivostock.

N.B.—The Manchus are a warlike farming people, the special products of the country being pulse, cereals, salmon, and furs (sable, etc.).

2. **Mongolia** is a dry dreary plateau, occupied by scattered tribes of herdsmen.

1. It is divided by the Altai ranges into two fairly equal areas, and an enormous proportion of both is filled up with the Gobi or Shamo ('sand-sea') desert.
2. Two trade routes run across the northern area from Peking *via* Kalgan—to the chief town, Urga, and the frontier market, Maimachin ('Trade City'), for Kiakhta and Irkutsk, and to Uliasutai and Kobdo.

N.B.—The people are ground down by the debased tyranny of the Lamas.

3. Like Mongolia, Eastern Turkestan is divided into two areas by a mountain range—the Tian Shan—and includes a large area of desert—the Tarim.

1. The small northern area—Zungaria—gives the easiest over-land route from China to Europe, *via* Barkul, Urumtsi and Kulja.
2. In the much larger southern area—Kashgaria—all the cities are situated on irrigated oases, either on the banks of

streams from the encircling mountains, *e.g.* Kashgar, Yarkand, Khotan, Karashar, or round wells, *e.g.* Kanchew, Ansifan, Hami.

3. Kashgar, on one of the chief head-streams of the Tarim, with the Terek-Davan and Terekti passes behind it, commands the trade with Russian Turkestan ; it is also the political capital, and weaves cloth out of the very fine wool. Yarkand, on the other chief head-stream of the Tarim, commands the Karakoram pass into Kashmir, and—like Khotan—has valuable deposits of jade.

4. The dreary lake-strewn, mountain-ribbed plateau of Tibet is the highest continuous area on the face of the earth ; it is also the most priest-ridden.

1. The bulk of the people live in the Sanpu or Upper Brahmaputra valley, where a little agriculture is possible ; and the capital Lhasa ('God's Throne'), stands on the north, *i.e.* the sunnier, slope of the valley. The wealth of the country is practically limited to wool or hair from the yak, the goat, the native sheep ; and Yatong, Gyantse, and Gartok are 'British' marts. Shigatse and Dingti are military centres.

5. The European possessions are quite small, but have considerable political and commercial importance, Hong-Kong being much the most important.

1. Hong-Kong is a granite rock about the size of Holyhead Island ; but, with the British strip of Kowlun on the mainland, it shuts in one of the most magnificent harbours in the world—Victoria. Its only export is granite ; but its annual entry and clearing of shipping amounts to 14,000,000 tons, its annual trade is valued at nearly £50,000,000, and its political is nearly as great as its commercial importance.
2. The neighbouring island of Macao has belonged to Portugal since the year 1586. It is a centre of the opium trade *via* the Si-kiang valley from Yunnan, the chief poppy-growing province ; and, like the dependent islands of Taipa and Coloane, it has an important fishing industry.
3. The British naval station of Weihaiwei and the German naval station of Kiau-chou are both good harbours, with a healthy climate, occupying an obviously valuable strategical position, which is guarded on the north by the Japanese stations of Port Arthur and Talienwan.

KOREA.

THE rich valleys of Korea, with their peninsular climate, mark the transition, in political development as well as in geographical features, from China to Japan.

1. The coast-line resembles somewhat that of Great Britain—being bold and rocky towards the ocean (E. side), but low and sandy towards the continent—with heavy tides on the west and light ones on the east, and with a number of adjacent islands, *e.g.* Quelpart, which breeds ponies. Cf. the Shetlands.
2. The surface also has some resemblance to that of Great Britain—being about the same size, and having a water-parting running down it from N. to S., much nearer the ocean coast than the continental (W. side). Cf. the route of the railway from Masampo and Fusan *via* Seoul to Wiju.
3. Seoul, amid the seclusion of hills in the heart of the country, and commanding the head of the chief river-valley, occupies an appropriate site for an old capital; its port, Chemulpo, obviously controls the trade with China—largely in ginseng root; and the port of Fusan obviously controls the natural trade with Japan. The Japanese have constructed railways from Seoul to the most important outposts, *e.g.* Fusan, Chemulpo, Wiju, and Wonsan.

N.B.—Rice, beans, and ginseng are exported; and the country is rich in minerals (including coal and iron) and in all kinds of fibres (especially tobacco and cotton).

JAPAN.

1. THE Empire of Japan or Nikon ('Rising Sun') is rather larger than the United Kingdom, but resembles it in several ways: *e.g.*

1. As a group of islands, one of which is much larger than the rest. Besides the Honshu or 'Main Island' and its immediate neighbours, the Empire practically includes all the islands between the Philippines and Kamchatka, Formosa being specially valuable.

N.B.—The Japanese portion of Sakhalin, given to Russia in 1874 in exchange for the Kuriles or Chishima islands, was recovered in 1905.

2. As an island group lying to windward of a populous continent, with a number of splendid harbours and abundance of coal and iron.
2. The mass of the country (30° - 45° N.) is very mountainous and—in the centre—largely volcanic.
 1. The chief peak is the beautiful cone of Fuji-san (12,400 feet); the chief range runs down Honshu from N.E. to S.W., presenting a full face to the S.E. monsoons; a number of the volcanoes are still active, *e.g.* Aso-san, and are surrounded by hot springs; and various spurs from the main range descend precipitously into the deep Pacific waters, forming magnificent harbours of refuge.
 2. The height of the mountains and the narrowness of the country cause the rivers to be little more than torrents, very few being navigable; and their great force and the friable nature of the volcanic soil cause them to carry down immense quantities of alluvium.
3. The climate of the chief islands depends on their nearness to the great continent of Asia and to the Kuro-shiwo or 'Black Stream.'
 1. As all the east coast and part of the west coast are washed by the warm waters of the Kuro-shiwo, the fall of rain and snow must be considerable; but, as the prevailing wind is northerly in winter and southerly in summer, the warm current does not influence temperature much.
 2. The meeting of the warm current with the cold Kurile current causes dense fogs, especially off the E. of Yezo and N.E. of Honshu; and the change of monsoon farther south is accompanied by dangerous typhoons. The effect of the cold current is also seen in the frozen harbours of Yezo, and in the low average temperature in the larger islands compared with islands in the same latitude off Europe, *e.g.* the Azores. Cf. p. 298.
 3. The climate, of course, changes with the latitude—to almost arctic extremes in the Kuriles, and to tropical extremes in Formosa.
4. Both the mineral and the vegetable products are very valuable.
 1. The characteristic metal is copper, the Ashio mines near Nikko being the largest in Asia; but coal and iron are also important, the coal especially in Kyushu and Yezo.

2. The possession of coal and iron has helped the rapid development of railways, the Yezo coal being very convenient for the—destined—Aomori terminus of the trunk system. The river valleys have also greatly facilitated railway-construction across the country, *e.g.* from Tokyo to Niigata and from Kyoto to Kanazawa.
3. The characteristic vegetation includes gigantic cedars, the camphor laurel, the lacquer tree, and the chrysanthemum ; but the most important economic plants are rice in the central lowlands, tea in the central highlands, and mulberries in the provinces of Shinshu, Kotsuke, and Koshu.
5. Most of the larger towns, except Kyoto, derive their prosperity from their command of comparatively wide and exceedingly fertile plains.
 1. Tokyo (about 1,820,000 inhabitants) stands on the banks of the Sumida-gawa, which drains the largest plain in the empire ; it has no harbour, but has rail to Yokohama and to the petroleum port of Niigata at the mouth of the Shinano river. The typical industries are lacquer work and matches.
 2. Osaka (nearly 1,000,000), the 'Venice of Japan,' on the shore of a beautiful archipelago, has used the water-power of the Yodo-gawa from the great L. Biwa to make itself the chief entre of cotton-spinning ; it has also a shipbuilding industry, but much of its trade goes by rail through the double port of Hyogo-Kobe.
 3. Kyoto (about 380,000), which is also supplied with water from L. Biwa, is in the centre of the best tea district and one of the best silk districts. The capital was removed from here to Tokyo only on the fall of the old Shogunate or Military Tyranny in 1868.
 4. Yokohama (330,000) and Kobe (290,000) are the great harbours,—Kobe having the richer country behind it, but Yokohama having the dense population of Tokyo.
 5. Nagoya (290,000), on a large and fertile 'rice-plain,' is the largest city on the Tokaido Railway, which joins the modern to the ancient capital ; its characteristic industry is porcelain, for which the neighbouring village of Seto is very famous.
 6. Nagasaki (150,000) has, however, the finest harbour of all, with the excellent coal of Takasima at the entrance of its landlocked bay ; and Hakodate has a similar position, with excellent coal and a landlocked harbour, in Yezo.

7. Hiroshima (120,000) became suddenly famous in 1894-95 as the central military camp during the Chino-Japanese war, which resulted in the annexation of Formosa (with the Pescadores).

Camphor and tea from the forested eastern highlands of Formosa, and sugar and rice from the alluvial western plain, are exported from Kelung, Tamsui, Anping, Takao.

ASIATIC RUSSIA.

THE Russian sphere of influence in Asia extends from the Caspian to Behring Strait and the Sea of Okhotsk, and from the edge of the Central Plateau to the Arctic Ocean.

1. The sub-divisions of this huge area are mainly river-basins,—one of inland and four of oceanic drainage; and the general slope from S.E. down to N.W. makes all the rivers except one flow from the S.E.
2. The Turan or Aralo-Caspian inland drainage area is very low—in some places, below sea-level—and both its lakes and its rivers are drying up, although the Amu Daria flows from the Pamir and the Syr Daria from the Tian-shan. A large part of the area is steppe, but there are also real deserts, extending *e.g.* over half Turkestan. The largest lake is Aral, which is nearly as large as Scotland and very salt; L. Balkhash is not much less. Cf. Caspian Sea, p. 53.
3. The oceanic or Siberian drainage area is naturally divided into two-parts—a western or lowland and an eastern or highland. The west is so low and level that marsh water flows indifferently into the Obi or the Yenisei according to the direction of the wind.

Along the north there is the expanse of ever-frozen tundras, caused partly by the flooding of the rivers, as the ice in their upper or southern courses melts long before that near their estuaries. Cf. p. 137.

The tundras give place to a belt of forest, which shelters innumerable fur-bearing animals; and, in the Ob basin, the belt of forest merges in fine grain-growing land. Transport can be had in the short summer over some 9000 miles on the Ob and its tributaries, of which the Irtysh is longer than the so-called main-stream. Cf. p. 315.

4. The eastern highlands are remarkable for the rich gold area round L. Baikal, the mammoth ivory along the Lena and in the Liakhov Islands, the Pacific drainage of the great Amur river, and the active volcanoes of Kamchatka.

The gold is specially rich in the Altai and Sayan mountains, from which there is easy transport in summer, *via* the Yenisei and its tributaries, of which the Selenga is longer than the so-called main stream. Cf. the Irtysh.

The eastward course of the Amur gives it special importance for the expansion of Russia towards the Pacific; the ten Kamchatkan volcanoes are the only active ones in the Russian Empire; and L. Baikal is the largest and deepest area of fresh water in Asia.

5. The climate is essentially continental, with very great extremes, which increase from west to east; the want of protection from N. winds and the want of access for S. winds make the cold intensely severe, and the wide expanse of low level causes atmospheric disturbances to spread with remarkable rapidity. Unfortunately, too, the reckless destruction of timber in the forest zone—the only protection along the north—is increasing the dryness.
6. The special products include gold, ivory, fur, grain, and animals; and these are now collected by the Trans-Siberian and Trans-Caspian railways, though both lines are of even more strategic than commercial value. Cf. p. 159.

The Trans-Caspian line runs from the port of Krasnovodsk to Tashkent and to Kushk, with an important junction near Merv; the Trans-Siberian line (T.S.R.) runs from Samara *via* Irkutsk (across or round Lake Baikal) and Stretensk to Vladivostok, with an important junction for Port Arthur at Chita.

7. The political and commercial capital of the Russian Central Asia area is Tashkent (156,000), on a fertile oasis which raises a great deal of silk, is the focus of an immense trading-area, and has a leather industry in connection with the surrounding steppe pasture.

Bokhara, like the old slave-market of Khiva, has only a shadow of its former glory, but it is still a natural trade centre between Persia and China, Russia and India; Kokan is a modern commercial centre commanding the upper valley of the Syr Daria, as Samarcand commands the fertile valley of the Zarafshan; Askhabad is a convenient political capital of the Turkoman district.

In Siberia, Tobolsk has a characteristic site for an old capital—a rock at the confluence of two large rivers; Omsk is also

a waterway junction, an important railway-station, and a steppe market ; Tomsk contains the one university of Siberia ; Krasnoyarsk is the centre of the Yenisei-valley gold-mining ; Irkutsk, the capital of Eastern Siberia and—thanks to the Polish exiles—the most intellectual town, was for some time the terminus of the T.S.R., and will always be an important rail and lake junction.

Chita is the capital of Trans-Baikalia ; Nerchinsk is the centre of a great mining district, including some mercury mines ; and Vladivostok is a very important railway terminus on a bay that is ice-free for almost all the year. Its prospects were clouded by the Russian leasing of Port Arthur and Talienwan, which are always free from ice ; but, with the transfer of the whole Port Arthur peninsula to Japan, Vladivostok is regaining its old importance.

THE EAST INDIES.

1. THE East Indies consist of two archipelagoes divided by 'Wallace's Line' from Lombok Island *via* the Macassar Strait to the S.E. corner of Mindanao.

1. The islands to the N.W. of this line are said to be Asiatic, those to S.E. of it are said to be Australasian.
2. The climate is everywhere tropical—hot and damp, and the Philippines are also within the typhoon area ; the soil is very largely volcanic, and—under the heavy and constant rainfall—vegetation is exceedingly luxuriant.
3. Except the Philippines, British Borneo, and Portuguese Timor, the area is entirely Dutch.

2. The Philippines have a total area about the same as that of the United Kingdom.

1. Luzon is the most fertile, as well as the largest island ; and, like Panay, it produces sugar and tobacco. Panay also produces hemp ; and its neighbours, Zebu and Samar, produce coal. More coal comes, however, from Mindanao, which also produces gold and mercury.
2. Manilla, which gives its name to the hemp, is much the largest town (220,000), and occupies an appropriate site for a capital—the shores of a fine harbour looking towards the mainland of Asia.

3. The British area in 'Borneo' includes North Borneo, Brunei, Sarawak, and Labuan.

1. It produces excellent camphor, tobacco, and coal—the latter from both Borneo and Labuan; coffee and pepper are also cultivated, and gold and diamonds are found. Such curiosities as edible-nests and sea-slugs are collected for the Chinese merchants. Sandakan and Kuching are the chief towns.

4. The greater part of Timor (with the dependent Larantuka district of Flores) belongs to Portugal.

1. It includes Dilli, the best port in the island, and some exceedingly fine 'coffee' lands. Cacao, spices, and sandal-wood also grow well.

5. The Dutch islands have very valuable exports of coffee and sugar, tobacco, tea, and indigo being also important.

1. Though not the largest island, Java (=England) is the most important because it is the most fertile, the most densely peopled, the most highly cultivated; it is also the most volcanic. The only good port on the bold south coast is Tjilatjap; but on the low north coast Batavia has a fine harbour at Tandjong Priok, the Soerabaya estuary is well sheltered by Madura and has navigation up the Solo river, and the dangerous roadstead of Samarang is the nearest port to the great native capital of Soerakarta.

N.B.—The island of Bali marks the east end of the submerged Asiatic plateau.

- 2 As Sumatra (= nearly 4 Englands) has its narrow mountain chain running close along the S.W. coast, there is room for large placid rivers on the N.E. plains. Its special products are tobacco, *e.g.* from Deli and Ranau; black pepper, *e.g.* from Telok-betong; coal from behind Padang; gold from round Jambi and Palembang (the largest town, 50,000); and immense quantities of tin from the dependencies of Banka and Bileton.

N.B.—Telok-betong suffered severely from the sea-wave caused by the bursting of Krakatoa in 1884.

3. As Borneo is crossed by the equator, it has, like Sumatra, 'two sets of seasons'; but, unlike Sumatra, it has no volcanoes. It has a large amount of low level land threaded

by navigable rivers and covered with rice. Dutch Borneo (= France) exports tobacco, sugar, pepper, birds' nests, sea-slugs, and gutta-percha—the last mainly from the large port of Pontianak. The chief town, Bandjermassin, has about 45,000 inhabitants.

4. As the island-tipped peninsulas of Celebes are almost as mountainous as the central mass—'the body of the star-fish'—it is all comparatively unexplored, and the only parts effectively occupied are the Macassar and Minahassa peninsulas. Its special products are macassar oil (a tree sap), tortoise-shell (really turtle-shell), sea-slugs, pearls, spices, and coffee; but its height makes it so healthy that the Dongala district is even famous for horses. Macassar is the most important native mart in the whole archipelago.

N.B.—The Minahassa coffee is exported from Menado during the east monsoon, but from Kema during the west. Cf. p. 203.

5. The Moluccas, or Spice Islands, are traversed by the great volcanic chain of the archipelago, many of the islands being volcanic cones, while others are coral reefs. The Amboyna group is famous for cloves, and the Banda group for nutmegs; Ceram exports sago; and the Australasian character of the group is marked by the presence of, *e.g.*, kangaroos.

N.B.—Compare the shape of Gilolo with that of Celebes.

6. The proximity of the Lesser Sunda islands to the heated interior of Australia makes them very dry, horses and sandalwood again appearing as products, *e.g.* in Sumbawa and Sumba.
7. The Dutch area of New Guinea, though it is larger than the British and German areas taken together, is almost an unknown land.

AUSTRALASIA AND POLYNESIA.

Introductory.

AUSTRALASIA comprises Australia, Tasmania, New Zealand, British New Guinea, and the Fiji islands.

1. Polynesia is the name generally given to the multitude of small islands scattered through the Pacific ; and Polynesia and Australasia are sometimes classified together as Oceania.

AUSTRALIA.

Surroundings.

1. Australia is an island, but it is so large that it may be regarded as a continent.

1. It is 25 times the size of the United Kingdom, and ranks next to Canada among the individual areas of the Empire.
2. The surrounding oceans, the winds, and the surface, all emphasise the continental rather than the insular element in its climate and productions.
3. Its oceanic isolation emphasises the insular element in its politics and commerce.

2. The coast line is singularly unbroken, which affects both climate and commerce adversely.

1. The indentations which do exist, *e.g.* the Gulf of Carpentaria and the Great Bight, have little effect on the 'solidarity' of the whole continent.

2. Warm currents wash the N., E., and S. coasts, which would carry abundant moisture inland if the coasts were broken and the winds blew regularly inland; and which do encourage innumerable forms of marine life, *e.g.* turtles, oysters, sponges, coral, etc., in the shallow waters.
3. The S. and W. coasts are the worst; along the W. coast there is a cold current, off which evaporation is slight and slow, and the interior is a desert.

3. The South coast has two natural divisions.

1. The western half is an almost unbroken wall of rock for nearly 1000 miles. Albany, on King George's Sound, is the only real harbour, though Esperance Bay may become an important roadstead in connection with the Coolgardie and Kalgurli goldfields.
2. The eastern half is much more broken—Spencer Gulf, the Gulf of St. Vincent, and Port Philip being really valuable harbours; but abrupt cliffs, a heavy swell, and sunken islands make navigation difficult and dangerous. Cf. p. 359.
3. Port Augusta and Port Pirie are fairly good harbours. The former is the outlet for a large pastoral and wheat area, and the terminus of the—as yet unfinished—*Great Northern Railway*; the latter is the chief wheat port of Australia, and has a large through trade to the N.S.W. silver mines at Broken Hill and Silverton.
4. Port Adelaide has a good natural harbour under the lee of Mount Lofty, and is more important than it would be if the mouth of the Murray river could be used as a harbour.
5. Port Philip is one of the most important harbours in the southern hemisphere. It has an area of 300 square miles, and is very safe; vessels can go up the Yarra into the very heart of Melbourne, and the city monopolises the whole export trade of Victoria in gold, wool, wheat, and butter.

4. The West coast, from Cape Leeuwin to Cape Leveque, is low, monotonous, and blocked by coral reefs,

1. The shallow water, the cross currents, and the summer hurricanes make navigation very precarious, especially in the north; and the north is also very unhealthy, and has very high tides (46 feet regularly in King Sound).
2. Shark Bay, the only important northern inlet, has a valuable pearl fishery. (Cf. the warm, shallow Manar Gulf, p. 337.)

3. In the south, Fremantle has been made into a fairly good harbour to accommodate the trade up to Perth, and has a large salt industry. (Cf. the N.W. coast of India, p. 333.)
5. The North coast, from Cape Leveque to Cape York, has a vile climate, but several fine bays.
 1. The best is Port Darwin, the harbour of Palmerston, which has excellent accommodation for shipping, and is accessible by the largest vessels in any state of tide or weather. It is the junction of the Overland Telegraph with the Eastern Cable, and the destined terminus of the Trans-continental railway.
6. The East coast has special advantages in the possession of some fine harbours and good coal, and the protection of the inshore water for 1200 miles by the Great Barrier Reef.
 1. Brisbane commands the coal and wool trades of South Queensland ; Rockhampton commands the gold and cattle trades of Central Queensland ; Townsville commands the gold trade of Charters Towers and Ravenswood ; Cairns commands the tin trade of Herberton, and exports millions of bananas ; Cooktown—opposite the most northerly channel across the Reef—also has a tin trade, and exports rice, sugar, and sea-slugs.
 2. The New South Wales ports are even more important, and some of them are wonderful natural harbours, *e.g.* Botany Bay, Broken Bay, and Port Stephens ; but they have been neglected for the artificial coal port of Newcastle and the unique harbour of Port Jackson.
 3. Port Jackson is a large, deep, and perfectly safe harbour, with a natural wharf of freestone on each side of the promontory on which Sydney stands ; it has a splendid climate, immense agricultural and pastoral wealth behind it, and excellent coal on each side, at Newcastle and Wollongong.

Surface and Climate.

1. Australia is a huge saucer-shaped plateau, with a rim of low coastland on every side except the south.

1. The edge of the plateau looks from below like a range of hills—rising abruptly from the coastline, only to break off abruptly on to the plateau ; and this has a very bad effect on the rainfall inland. Cf. Africa.
2. As the plateau sinks saucer-like inland, its shape favours the accumulation of water underground in the limestone of which the country is largely composed ; but the dry soil and the great heat give surface water very little chance of sinking at all.
3. The strip of low coastland which is missing in the south, reappears in a line of sunken islands. (Cf. p. 357.)

2. These low coastlands are the best watered parts of the whole continent, especially in Queensland.

1. Even in the west, where there is a cold current, and where no regular winds blow inland, enough moisture is carried to the Darling Range to give excellent pasture between the hills and the sea.
2. Along the north coast there is enough moisture to produce—in the tropical heat—even sugar and rice ; but the climate is very unhealthy, and the damp, hot, still air favours the development of hurricanes. Thursday Island is a fortified coaling-station, and the headquarters of the pearl fishery.
3. As the edge of the plateau is very near the sea, the coastal rivers are short and subject to sudden floods ; and along the east coast, where the S.E. 'Trades' blow directly on to the Great Dividing Range, much havoc is done by the floods to valuable agricultural land, and navigation is made impossible or very precarious.
4. The exceptionally heavy rainfall in N.E. Queensland is due to the fact that the S.E. 'Trades' are condensed by the 5000 feet of the Bellenden Ker Mountains.

3. The great Dividing Range forms the highest part of the plateau edge, and in Mount Kosciusko and Mount Townsend rises to about 7000 feet, *i.e.* twice the height of Snowdon.

1. The name 'Great Dividing Range' may be fairly applied to all the successive 'ranges' which divide the coast from the interior, the most important being the Australian Alps.
2. Even these Alps are practically below the snow line in such a latitude ; and consequently the rivers which flow from

them, even the Murray and the Murrumbidgee, though very useful for irrigation, are almost useless for navigation.

3. As the range entirely cuts off sea winds from the interior, there are vast areas of desert ; and, as the great dryness is naturally accompanied by great and sudden extremes of climate, the deserts are deeply covered with the sands of disintegrated rocks.

4. The distribution of these deserts reflects the special characteristics of the surface.

1. As the length of the continent from east to west (nearly 2400 miles) is more than twice its average width from north to south (about 1000), some part of its surface is absorbing the sun's rays vertically in summer for three hours every day ; and, owing to the earth's position in perihelion, the sun is 1,500,000 miles nearer to Australia in the 'southern' summer than to the Sahara in the 'northern' summer.
2. The absence of inland peaks high enough to condense clouds, and the tendency of the plateau edge to stop sea winds entirely or to deflect them into a higher stratum of atmosphere, increase the already excessive heat.
3. The absence of shade still further accentuates the evil, and combines with the radiation from the parched interior to produce severe droughts ; and the unevenly distributed rainfall is apt to lead to destructive inundations at the end of every drought.
4. As each Tropic in turn is for half the year the centre of a belt of calms, no regular supplies of moisture can be carried to it during that half, even when it is not cut off from wet winds by physical obstacles. Consequently, the Great Sandy Desert lies along one side, and the Great Victoria Desert along the other side, of the Tropic of Capricorn. (Cf. the Sahara and the Kalahari deserts in Africa.)

5. The river system, again, reflects all these peculiar features.

1. As in Africa, the desert is not a dead level, nor a sea of sand, nor entirely barren. Most of it is a low humpy plateau ; it contains mountain ranges as high as Snowdon, *e.g.* the Macdonnell (cf. the Tibesti Mountains) ; and a low sandy plain stretches across it from north to south (cf. the Libyan Desert).

2. The countless subdivisions thus created have their own—temporary—river systems, all of which end in salt basins (cf. the Saharan Shotts) wherever their water is not at once absorbed by the thirsty soil or lost by evaporation.
3. The one exception is the Murray system, which rises amongst peaks high enough and near enough to the sea to have snow lying on them for some months.

Vegetation and Minerals.

1. Most of the indigenous vegetation is, therefore, of a semi-desert nature.

1. True desert vegetation consists of plants which, by lengthening their roots, or shortening their height, or thickening their bark, or toughening their leaves, or presenting only the narrow edges of the leaves to the vertical sunlight, or secreting volatile oils, have adapted themselves to draw water from great depths, or to resist the evaporating power of very dry air, *e.g.* cactus, acacia, eucalyptus, salt-bush, mallee-scrub, etc. Cf. p. 257.

The eucalyptus and the salt-bush are particularly important. Both the 'gum' and the timber of the former are very valuable; and millions of sheep are fed on the salt-bush, especially in N.S.W. (Cf. the Karroo.)

2. With such a deficiency of rain and rivers inland, it is obvious that agriculture must be limited; and, as sheep pasture is less dependent on rain than any other pasture, wool is the greatest of all Australian products.

1. N.S.W., which practically monopolises the continental river system, is far ahead of the other colonies in the amount of wool which it produces.
2. As both heat and rainfall increase towards the N.E., Queensland is better suited to cattle than to sheep.
3. As the heat decreases, but the rainfall increases, towards the S.E., Victoria produces the best wool, especially on the volcanic soil of the Ballarat gold area; and this soil is also peculiarly well suited for dairy farming, especially round Benalla.

3. Agriculture is naturally confined to the edge of the plateau and the coastlands.

1. The cooler and drier plateau edge produces plants like wheat and the vine, and the latter is particularly profitable. Its long root enables it to resist drought, it requires industry rather than capital, the climate is perfect, and the stony slopes of the downs are an ideal site.

The best wine comes from the volcanic valleys of Victoria, *e.g.* Ararat, Mooropna, and Rutherglen, and the downs of Queensland, *e.g.* Roma and Toowoomba—the lower land, where the vines get ‘baked,’ producing the heavier wines; and the best raisins come from the drier area of the Murray basin, *e.g.* Albury, Echuca, and Mildura. Cf. p. 110.

2. The tropical coastlands produce sugar, maize, and bananas. The sugar naturally prefers the fertile, marly soil and intermittent salt-breezes of the S.E. ‘Trades’ coast, especially between Geraldton and Herberton, and round Townsville, Mackay, and Bundaberg. The maize grows most abundantly on the low lands between Brisbane and Rockhampton, and the bananas are specially productive round Cairns.

N.B.—Cotton, coffee, cacao, rice, and other tropical crops are raised.

4. Coal exists in abundance along the east coast, and most of it is of very good quality.

1. Newcastle, Illawarra, and Lithgow produce the largest amount and the best quality; but the Ipswich field is also very useful.

5. The great gold colonies of Victoria, West Australia, and Queensland.

1. The historic mines of Victoria are round Ballarat, Castlemaine, and Bendigo (Sandhurst); the modern El-Dorados of ‘Westralia,’ *e.g.* Coolgardie and Kalgurli, stand where neither water nor timber is at hand; Queensland has rich fields at Charters Towers, Mount Morgan (which has paid £4,500,000 in dividends since 1885), and Gympie.

6. Copper is the characteristic metal of South Australia as silver is of N.S.W. and tin is of Queensland.

1. Moonta and Wallaroo are the chief copper centres, and have the largest smelting works in Australia—the old Burra

mine at Koorunga and the Kapunda mines being worked out. N.S.W. and Queensland also raise large quantities.

2. The silver comes from Silvertown and Broken Hill, which are reached most easily *via* Port Pirie.
3. The tin extends along the Queensland heights from Cooktown to Stanthorpe. Cf. p. 333 and 339.

Towns.

1. Sydney and Melbourne are the only really large cities, the former with rather more and the latter with rather less than 525,000 inhabitants; Adelaide has about 175,000, and Brisbane about 130,000.

1. Melbourne owed its rise to the extraordinary output of gold (£10,000,000 a year for 10 years in succession), and has maintained its position by deepening the channel from Hobson's Bay, so that steamers of 8000 tons can now reach the heart of the city.
2. The lower parts of Brisbane are exposed to occasional floods; and its harbour is kept up to a high standard only by constant dredging. The town owed its importance originally to the rich pastoral and agricultural wealth of the Darling Downs, and the convenient coalfield of Ipswich.

2. Ballarat and Bendigo (Sandhurst) are busy little towns of from 40,000 to 50,000 inhabitants.

1. Ballarat has been for 50 years the centre of the richest goldfield in the world; and its beautiful climate and volcanic soil are a source of great pastoral and agricultural wealth, especially very fine wool.
2. Bendigo is the centre of another goldfield, with water peculiarly suitable for brewing.

3. Perth, Geelong, Broken Hill, Fremantle, and Charters Towers have populations of above 20,000.

1. Perth is the political capital of West Australia, and the natural centre of its inhabitable area.
2. Geelong has a good natural harbour on the estuary of the Barwon and Corio bay; and its semi-marine climate and

its nearness to the Ballarat wool district have made it much the most important centre of woollen industries in Australia.

3. Broken Hill is simply a silver town. (Cf. its neighbour—*Silverton*). And Charters Towers is a gold town.
4. Fremantle had some importance as the harbour of Perth and a mail-packet station, with a valuable salt industry; but its prosperity has been increased by the development of the Westralian goldfields.
4. Amongst the towns which have populations of from 10,000 to nearly 20,000 are the following:
 1. Rockhampton is the destined capital of Central Queensland, and the port of the Mount Morgan mines.
 2. Newcastle owed its rise to its large supplies of good coal at the mouth of the Hunter. It has a fine artificial harbour, and commands the valuable agriculture of the Hunter valley.
 3. Parramatta is a residential suburb of Sydney, very famous for its oranges.
 4. Goulburn, 2000 feet above the sea, on the main Southern Railway, is centre of the inland trade of N.S.W. Cf. Maitland.

TASMANIA.

THE heart-shaped island of Tasmania is about the size of Scotland.

1. On the north and west coasts the only indentations of commercial value are the Tamar estuary and Macquarie harbour; but on the south-east coast there are many, the best being the estuary of the Derwent.
2. Its surface is divided into two areas by the deep depression of the Tamar, Macquarie, and Coal rivers. (Cf. Caledonian Canal in Scotland.) The eastern area is largely filled by mountains, of which Ben Lomond is the highest (5000 feet); the western area is partly mountainous, rising in Mount Cradle to over 5000 feet, and partly a lake-strewn plateau.
3. The height, the island position, and the latitude of the Roaring Forties, combine to give it constant 'Brave West Winds,' with a heavy rainfall and an even temperature.

4. Tin is the characteristic metal, and is worked mainly at Mount Bischoff in the N.W., and Bransholme in the N.E.; and there is good coal in the Fingal basin. Cf. p. 363.
5. The chief industries are sheep-rearing and fruit-culture. Hobart, the capital (pop. 36,000), and the chief port of the south, has numerous jam factories; Launceston (nearly 26,000), the chief port of the north, is the main wool and tin port.

NEW ZEALAND.

1. NEW ZEALAND is sometimes called 'the Britain of the south,' and there are several points of resemblance.

1. Its maritime position, coast line, division into two large islands, scenery, size, climate, and productions are all points of more or less similarity.

N.B.—Owing to the greater proportion of land north of the equator, the thermal equator (or line of greatest average heat) is about 6° N.

2. New Zealand is, however, much the nearer to the nominal equator; its north half is the hotter; it is much farther from the nearest land; it is in the centre of a water, not a land, hemisphere; and it draws some of its revenues from very different sources.

2. Its latitude, surroundings, and surface are very similar to those of Tasmania.

1. 'Brave West Winds' blow in 'The Roaring Forties' over thousands of miles of sea; and this sea is for many miles westward, *i.e.* to windward, shallow and warmed by equatorial currents.
2. The meeting of the cold Antarctic water with this warm equatorial water, the great length of the colony compared with its breadth, and the division into two islands by Cook Strait, cause many parts of the country to be subject to severe gales.
3. In the west of the South Island, where the mountains abut directly upon the shore, there is no commercial harbour, though the fiords supply shelter; and in the west of the North Island, where the mountains do not cut off communication inland so entirely, drift sand and the westerly gales spoil the otherwise good harbours, *e.g.* Manukau.

4. On the east coasts, where the islands themselves give shelter from the westerly gales, there are a number of good harbours—from Russell in the extreme north to Campbelltown in the extreme south.
 5. The backbone of the colony is the parallel system of mountain ranges which runs from the S.W. corner up to the N.E. corner, hugging the west coast—as the Southern Alps—in the South Island, and trending towards the east coast in the North Island. In the latter there are also, to the west of the main system, three remarkable volcanoes—Ruapehu (9000 feet), Egmont (8200), and Tongariro (7500); and along the line of Tongariro and Ruapehu there is the famous Hot Lakes District.
 6. Owing to the narrowness and general hilly character of the North Island, and to the mountains presenting a full face to the wet west winds, the rivers are short, rapid, and liable to floods; but the direction of the Waikato gives it greater length, and Lake Taupo helps to moderate its floods, so that it is of some use for navigation.
 7. As the Southern Alps reach (in Mount Cook) a height of over 12,000 feet, and are very near the west coast, they are the cause of a very heavy and sudden precipitation, and are covered with glaciers; and, though there are wide stretches of plain on the lee side, *e.g.* Canterbury, the volume and pace of the rivers make them useless for navigation, —even lakes like Wakatipu and Te Anau being powerless to neutralise the floods.
3. Pasture, agriculture, and mining are all important, the pastoral products being very valuable.
1. The insular climate, volcanic soil, and hilly surface are most favourable to English grasses; but much splendid forest has been sacrificed to make room for pasture. Oamaru and Timaru are specially 'mutton' ports.
 2. Wheat flourishes on the warm dry plains of Wellington and Marlborough; oats does best in the colder and damper climate of Canterbury and Otago; phormium, or native flax, grows along the low banks of the Waikato.
 3. The chief coal mines are just behind the roadsteads of Westport and Greymouth, and the coal is of excellent quality; and gold is found in the same district, especially round Reefton and Lyell, Kumara and Hohitika. It is also mined in the Coromandel peninsula and the Clutha valley.

N.B.—The abundance of water and timber on the windward side of the Nelson and Westland mountains makes the mining very cheap, and the mountains are so near the sea that hydraulic mining cannot devastate large areas of rich land, as it does, *e.g.* in California.

4. Auckland and Christchurch have respectively 67,000 and 57,000 inhabitants; and Dunedin has rather more, and Wellington rather less, than 50,000.

1. Auckland has a double harbour, though the east port (Waitemata) is much better than the west (Onehunga), and commands all the trade by rail and road across the isthmus between the two.
2. Christchurch is the outlet for the comparatively dense population of Canterbury, and has been provided with a fine artificial harbour at Port Lyttleton.
3. Dunedin has an equally good harbour in Port Chalmers, and monopolises most of the Otago trade.
4. Wellington is the political capital of the colony, and has a deep and land-locked, but somewhat windy, harbour in Port Nicholson. Cf. § 2 (2) above.

PACIFIC ISLANDS.

1. NORTHWARD from New Zealand the floor of the Pacific is raised in two great curves, which come to the surface in two lines of islands.

1. The inner, or Melanesian, line contains Norfolk Island, New Caledonia, the Loyalty, New Hebrides, and Solomon Islands, and ends in New Guinea; the outer, or Micronesian, line contains the Fiji, Samoan, Tonga, Ellice, Gilbert, Marshall, Ladrone, and Caroline Islands. The islands are either of low coral or of high volcanic formation (cf. the Bahamas *v.* Dominica in the West Indies), the coral islanders having to work hard for their living, while the fertile volcanic islands encourage laziness and want of thrift.
2. The Fijis are volcanic mountains, with admirable harbours behind barrier reefs; turtles and pearl oysters haunt the reefs, coco-palms and sugar plantations clothe the coast-lands, and the forested windward sides of the mountains

produce immense quantities of bananas. Sugar, copra, and bananas are exported from Suva and Levuka.

3. The Solomon Islands contain typical examples both of the low coral and of the high volcanic formation; San Christoval has a good harbour, and Ugi is a British coaling-station. New Caledonia is famous for its great barrier reef (cf. p. 358) and its export of coffee and nickel; Noumea, the capital, has a good harbour behind the island of Nou.

4. British New Guinea has an area as large as Great Britain. It is divided from the German area by mountains, the chief range—the Owen Stanley—rising in Mount Victoria to over 13,000 feet; and the southward, *i.e.* British, slopes of all the system are covered with timber, mainly cypress.

The whole country is very well watered; its largest river—the Fly—is tidal for 100 miles, and more or less navigable for 500. The coasts of the Gulf of Papua produce turtles, pearls, and sea-slugs; and the unhealthy interior produces all kinds of tropical vegetation. The most central harbour is Port Moresby; the island harbour of Samarai commands the eastern trade, and the island harbour of Daru commands the western.

2. Besides these two submarine lines of elevation converging on New Zealand, there are two similar lines along the two tropics.

1. The northern, or Hawaiian, line—which contains no British possessions—has an extremely important harbour in Honolulu, commanding 'the cross-roads of the North Pacific'; the southern, or Paumotu, line contains the British possessions of Pitcairn Island, the Cook Islands, and the important French possessions of Tahiti.

N.B.—Owing to the ocean currents, the climate of Hawaii is remarkably moderate. Cf. p. 170.

2. A somewhat similar longitudinal rise, joining these two more important lines of elevation, contains a number of small British possessions, *e.g.* Manihiki, Malden, Jervis, Christmas, Fanning, etc., from which periodical visitors collect guano and coco-nuts.

APPENDIX
ON
PEOPLE, GOVERNMENT, RELIGION.

1. MANKIND forms a single distinct group among the higher mammals, with originally a common home.

1. The dispersion from this common home took place during the 'Tertiary' age, when the distribution of land and water was very different from what it is now. For instance, there was almost continuous land from Java to North America, to Madagascar *via* the Deccan, and to New Zealand and Australia *via* New Guinea.

N.B.—The Javanese 'Missing Link' was discovered by Dr. Dubois in 1892.

2. This distribution of land allowed instinctive and impulsive dispersion of mankind along the physical lines of least resistance, without any knowledge of navigation or of any other art except that of manufacturing the rudest stone implements.
- 3 This dispersion was followed by the development of varieties, each variety being developed by slow adaptation to its special surroundings—climate, food, neighbours, etc.; and, as most progress was made where the environment was most favourable, the highest and most rapid development was made on the warmer lowlands of the North Temperate Zone, *e.g.* China, Mesopotamia, and Egypt, and on the tablelands of the Tropics, *e.g.* Peru, Mexico, and Colombia.

N.B.—The South Temperate Zone has a comparatively small area, a very large portion of which is hot desert.

2. The progressive stages of development are marked most obviously by typical features of religious, political, and commercial life.

1. All the great religions of the world, *e.g.* the Buddhist and the three monotheistic forms, sprang from the North Temperate Zone ; and the three Monotheistic religions all sprang from the desert, and bear clear traces of their original environment, *e.g.* in their stern denial of self-indulgence—"Thou shalt *not* !"
 2. The same area has also given us all the higher orders of speech—Aryan, Hamitic, and Semitic ; while Tropical lowlands, *e.g.* in the East Indies, and Temperate plateaus, *e.g.* Tibet, are still in mere barbarism.
 3. While other areas have seen the exercise of certain industries which are practically necessary to human existence, *e.g.* fishing and pasture, this particular area was the home of almost all the higher industries connected with these primitive ones, *e.g.* navigation and weaving.
3. Progress in the art of living together has considerably mixed and modified the distinctive characteristics of the various groups.
1. All hunting (and fishing) people tend to be nomadic, because they soon exhaust the supplies of any one spot ; and, therefore, a large area of land will support only a few persons—and that only in a precarious way—and there is very little political organisation. The hunting areas, *e.g.* the Tundra, are usually not suitable for any other occupation ; and therefore, to keep down the number of possible competitors for the one limited means of subsistence, infanticide and neglect of the aged and weak are very common. This also implies generally the cruel and arbitrary rule of a temporary despot.
 2. Pastoral people also tend to become nomadic (cf. p. 9) ; but their occupation is much more economical than hunting, and involves—if the flocks are large—strong development of family life. They can either—under favourable circumstances—adopt the alternative occupation of agriculture, as on the irrigated grass-lands of the world, or—under unfavourable—as on the driest steppe, become mounted freebooters of the most formidable description, *e.g.* the Tatars. In either case the experience of age, *e.g.* in the patriarchy, and the personal prowess of the individual, *e.g.* a Madhi, are of supreme importance ; and thus the central authority tends to be the absolutism of a permanent (*i.e.* hereditary) Tsar or Sultan (cf. p. 10).

3. Agriculture is the most economic way of using land, and tends to dense populations, *e.g.* in India and China ; agricultural areas generally admit of other occupations besides agriculture, especially in 'old' countries ; and the dense population tends to progress in civilisation, *e.g.* the inventing of machinery and better methods of work.

The common cultivation of land seems to lead naturally to various types of Feudalism, in which great power comes into the hands of land-owning soldiers—a definite check on the power of the sovereign ; and, as personal property and individual opportunity increase with the development of trade, society practically becomes Republican.

4. Geographical environment affects men personally as well as in their modes of industrial occupation and political organisation.

1. If 'colour' is considered to be the most important mark of race, there seem to be five races—White, Black, Yellow, Brown, and Red ; but the Brown is probably a branch of the Yellow, and the Red may be so.
2. If the special shape and character of the head is the most important mark, there seem to be four races—White, Black, Yellow, and Red. For instance, while the Black man has large round eyes, the Yellow man's eyes are small and oblique, and the Red man's are small and straight ; while the Black man has short woolly hair, the Yellow man's hair is long and lank, and the White man's is wavy.
3. If the local distribution is the most important mark, the original habitat of the Black man was tropical Africa and Australasia, the Yellow man expanded from Tibet, the Red man was essentially American, and the White man lived round the Mediterranean.

5. The White, or Caucasian, race, which is much the most numerous (nearly 800,000,000) and most widely spread, is divided into two main groups.

1. The northern, or 'fair,' group is characteristically solid, and even stolid, in temperament ; the southern, or 'dark,' group is fiery and rather fickle. The former includes specially the 'men of the plain'—from the North European plain to Hindustan ; the latter includes specially the 'men of the plateau'—from Spain to the Deccan.

2. About half the total number of White men are to be found in Europe, more than a third in the south-west of Asia, and more than a seventh in America ; they are highly civilised and mainly monotheistic.
 3. The typical 'White' area has been invaded by several Yellow peoples, *e.g.* Finns, Turks, and Magyars.
6. The Yellow, or Mongolic, race, comes second in point of number (over 500,000,000) and in importance.
1. The conditions of life, except in the Malayan area, have stunted both physical and mental growth ; the average man rarely exceeds 5 feet 3 inches, and makes little intellectual progress.
 2. The northern Mongols—from Lapland and Hungary to Japan—are naturally hunters and shepherds ; the southern Mongols are essentially tillers of the soil, especially in China and Burma ; the oceanic Mongols, from the Malay peninsula to New Zealand, are typical fishermen, with such typical arts as rope-making and boat-building highly developed.
 3. Most of them are nominally Buddhists or Muhammedans, and nearly all of them are spirit-worshippers.
7. The Black, or Ethiopian, race, only numbers some 175,000,000 of whom 173,000,000 belong to the western, or African, division.
1. The Black man is essentially unintellectual and unprogressive, but he practises naturally agriculture and certain domestic arts. He is devoted to 'nature' and 'ancestry' worship, and indulges still in human sacrifices.
 2. In the Sudan and amongst the Bantu peoples, the Black man makes a fine soldier ; his average height is 5 feet 10 inches, and his other physical qualities are well developed.
 3. The eastern, or Australian, Black is a smaller, more savage, and treacherous creature, and the group is quickly dying out.
8. It is important, therefore, to distinguish between local, racial, and linguistic subdivisions of mankind.
1. Locality gives some indication of race ; for instance, White men are not found in large groups on tropical deltas or in wet jungle. But historical events have led to many changes of population, especially in Europe and America.

9. In Europe an overwhelming majority of the 360,000,000 people speak Aryan languages—Romance, Teutonic, and Slav.

1. The Romance, or Greco-Italian, language practically covers most of the area included in the old Roman Empire ; and, therefore, it is the least trustworthy guide to race.
2. The Teutonic language is usually the most trustworthy, at least in Europe ; but the great expansion of Teutonic peoples, especially the English, Germans, and Dutch, makes it less trustworthy outside Europe.
3. The peoples of Slavonic tongue are increasing rapidly inside Europe ; and Slav is displacing both other Aryan tongues, *e.g.* Lettic and Lithuanian, in Poland and in the west of Russia, and non-Aryan tongues, *e.g.* amongst the Finns and the Tatars, as Teutonic is displacing the Keltic in Wales and Ireland.
4. Roughly speaking, Latin and Keltic peoples belong to the Latin or Roman Church, but there are conspicuous exceptions in Scotland, Wales, and Switzerland ; Teutonic peoples are mainly Protestant ; and the Greeks and most Slavs belong to the Eastern or Greek Church.
5. In the Balkan peninsula, in spite of the great mixture of race and language, the fundamental distinction is religion, not race or language ; but practically all Turks speak a Mongolian tongue, and are Muhammedans.

10. Two-thirds of the inhabitants of Asia belong to the Mongolian type.

1. The White type is represented, *e.g.* by the Semites of Syria and Arabia, the Aryans of Persia and Hindustan, and the Slav conquerors of Siberia ; and the Dravidians of Ceylon and the Deccan are Black men.
2. The total population of Asia (about 870,000,000) is much greater than that of any other continent. Indeed, it comprises more than half the human race. But it is very unequally distributed, more than five-sixths living within the Monsoon area (India to Japan) ; and the average density is less than that of Europe.
3. Yellow men, to the number of some 425,000,000 in the Chinese and Japanese empires, profess Buddhism, itself an offspring of Brahmanism.

11. Africa, with a population of some 200,000,000, is mainly divided between four different races.

1. In the north there are two kinds of White men—Hamitic, *e.g.* the Berbers, and Semitic, *e.g.* in Abyssinia; the mass of the peninsula is occupied by Bantu Negroes, and the strip between the White men and the Bantus is held by Sudanese Negroes.

N.B.—Hottentots and Bushmen seem to be debased types of the Black race.

2. Practically all the 'Sudan' Negroes can speak or understand the Hausa tongue, as practically all the 'Bantu' Negroes can speak or understand Swahili.
3. Except in the so-called Christian country of Abyssinia, all the Hamites and Semites are Muhammedans; and Islamism is spreading widely among the Negroes.

12. America, like Australia, has been overrun by White men.

1. There has been great mixture of races—White, Black, and Red; but there are still pure-blooded Red men, *e.g.* the Eskimo and the Fuegians.
2. Out of a population approaching 100,000,000, nearly 80,000,000 live in the United States, and more than 12,000,000 in Mexico.

NOTE ON BRITISH POPULATION IN 1905.

The 'populations' on pp. 39-44 are based on the 1901 Census, but extension of boundary and other causes have greatly changed some of the figures; the most important changes are:

Glasgow, - - -	810,000	Bristol, - - -	360,000
Liverpool, - - -	730,000	Edinburgh, - - -	336,000
Manchester, - - -	620,000	Newcastle, - - -	265,000
Birmingham, - - -	540,000	Hull, - - -	260,000
Leeds, - - -	460,000	Leicester, - - -	230,000
Sheffield, - - -	440,000	Aberdeen, - - -	170,000

N.B.—Dublin 'proper' is still under 300,000.

PROBLEM PAPER.

1. Discuss the probable history of India or Africa if the peninsula had been in the north and the continental part in the south. Cf. p. 239.

2. Illustrate the connection between race and occupation, especially in Africa and South America, and the connection of both with climate. Cf. pp. 216, 267.

3. Estimate the effect of planting trees round the edge of the various great deserts of the world. Cf. pp. 66, 116.

4. What special areas in the Tropics are most likely to be made suitable for European colonisation by the planting of eucalyptus, and why? Cf. p. 306.

5. Illustrate the circumstances which determine the position, growth, and characteristic industries of an important town. Cf. pp. 10, 173, 174.

6. Compare the position of the United Kingdom with that of Japan, and show what difference it would make to both if the earth rotated from W. to E. instead of from E. to W. Cf. pp. 8, 32, 42.

7. What physical features now aid commerce which once hindered it? And *vice versa*. Cf. pp. 19, 160, 186, 192.

8. How have geographical conditions favoured the growth of a White population in the various parts of the British Empire? Cf. pp. 45, 281, 294.

9. Compare the projected Nicaraguan Canal with the Suez Canal, and the position of Jamaica with that of Ceylon. Cf. p. 126.

10. Compare the political and economical value of the various European "Spheres of Influence" in Eastern Asia. Cf. p. 267.

11. What industries will flourish naturally in the Atlantic States of South America when they are fully colonised. Cf. pp. 17, 229.

12. What difference would it make to climate and commerce if a continuous line of high mountains ran along the north of Canada and Siberia? Cf. pp. 136, 137, 351, 352.

13. Illustrate from India and Ireland the danger of having only one food staple, and compare the need for artificial light in Manchester and Bombay mills. Cf. pp. 17, 93, 329.

14. How have the shape, structure, and situation of the great peninsulas of the Northern Hemisphere affected politics and commerce? Cf. pp. 107, 108, 113, 122, 319.

15. Describe and account for the shifting of Trade-Centres in the past, and suggest their probable movements in the future. Cf. pp. 17, 19, 112, 154.

16. Contrast the great physical features of the Old World with those of the New World, and try to estimate their respective effects on history. Cf. pp. 2, 3, 133.

17. Compare the physical conditions of the countries where civilisation (? 'progress in the art of living together') is most backward, and show how any conditions common to all of them may have prevented progress. Cf. pp. 196, 216, 226, 262.

18. Estimate the influence of rivers in concentrating people and products ('intelligence and materials') at great distributing centres Cf. pp. 4, 5, 91, 245.

19. How have animals adapted themselves to the zones which they now inhabit? And what is the value to man of such adaptation? Cf. pp. 64, 144, 282, 303.

20. What are the usual causes and effects of migrations of people? And why have they usually gone westward? Cf. pp. 3, 54, 315.

21. Contrast the natural advantages of some typical "Buffer States" with their present economic position, and try to account for the disparity. Cf. pp. 71, 123, 338.

22. Compare the position of Switzerland, Abyssinia, and Peru, for international relations. Cf. pp. 56, 102, 226, 276.

INDEX OF CHIEF NAMES.

ABBREVIATIONS :—*c* = cape, *g* = gulf, *i* = island, *l* = lake, *m* = mountain, *r* = river.

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